F350.
M58
1912
v.2

Digitized by the Internet Archive
in 2025

https://archive.org/details/bwb_C0-AEP-235_2

J80
A3
1912
v. 2

THE ABRIDGMENT 1912

CONTAINING MESSAGES
OF THE PRESIDENT OF THE UNITED STATES
TO THE TWO HOUSES OF CONGRESS

62D CONGRESS, 3D SESSION

WITH REPORTS OF DEPARTMENTS
AND SELECTIONS FROM ACCOMPANYING
PAPERS

IN TWO VOLUMES

VOL. II

COMPILED AND EDITED UNDER THE DIRECTION OF THE
JOINT COMMITTEE ON PRINTING IN COMPLIANCE WITH
SECTION 73 OF THE ACT APPROVED JANUARY 12, 1895

WASHINGTON
1913

UNITED STATES OF AMERICA
GOVERNMENT PRINTING OFFICE

CONTENTS OF VOLUME II.

	Page.
Report of the Secretary of the Navy	847
Judge Advocate General	907
Bureau of Yards and Docks	917
Bureau of Navigation	921
Bureau of Ordnance	942
Bureau of Construction and Repair	952
Bureau of Steam Engineering	965
Bureau of Supplies and Accounts	969
Surgeon General	981
Marine Corps	1015
Report of the Secretary of the Interior	1031
Commissioner of the General Land Office	1130
Commissioner of Pensions	1164
Commissioner of Patents	1183
Commissioner of Education	1189
Director of the United States Geological Survey	1199
Director of the Bureau of Mines	1206
Commissioner of Indian Affairs	1225
Report of the Secretary of Agriculture	1267
Report of the Secretary of Commerce and Labor	1519
Report of the Postmaster General	1651
First Assistant Postmaster General	1682
Report of the Civil Service Commission	1713
Report of the Interstate Commerce Commission	1747
Index to Volumes I and II	1805

174

REPORT

OF THE

SECRETARY OF THE NAVY.

NAVY DEPARTMENT,
Washington, D. C., November 20, 1912.

To the PRESIDENT:

SIR: I have the honor to submit herewith the annual report of this department for the fiscal year ended June 30, 1912, including operations to date.

ADMINISTRATION.

I am thoroughly convinced after a trial extending over three years that efficient administration of the Navy can not be accomplished by a Secretary without some sort of a board or council made up of expert advisers.

THE AIDS.

As the Secretary of the Navy comes into office unequipped to judge complex questions which require technical knowledge, it is proper when a matter comes to him which affects more than one bureau that he should send for his advisers and get the benefit of their knowledge and judgment on the matter.

He should be in a position to obtain expeditiously expert knowledge on matters of general policy and should have around him responsible advisers trained in the duties and requirements of the Navy and known to the public as well as to the Navy.

Thorough study resulted in the conclusion that there were four logical divisions in the Navy Department: Operations of the fleet, personnel, material, and inspections. With your authority four officers of experience and judgment were carefully selected as heads of these divisions and as advisory aids to the Secretary. They are without executive authority, but have a supervisory function and serve in an advisory capacity.

Through the aids the Secretary of the Navy receives expert responsible advice and is kept informed daily of what is going on in the department. They also serve in coordinating the work of the various bureaus of the department.

COORDINATED WORK OF DIVISIONS.

In cases where circumstances have made it necessary to expedite the dispatch of ships and men to protect the Government interests, to mobilize fleets, or to put through with accuracy of detail any operation requiring the simultaneous and coordinated efforts of the several divisions of the department, the present organization has proved itself reliable and efficient.

AID FOR OPERATIONS.

To-day the aid for operations gives his entire attention and study to the operations of the fleet. He works in conjunction with the War College and the General Board on war plans and strategic matters. Plans are being formulated and brought up to date. In any emergency the aid for operations is prepared to advise promptly as to the movements of ships and to submit such orders as are necessary to carry into effect campaign plans recommended by the General Board and approved by the Secretary. In other words, we are on a war basis, the council of aids serving as a strategy board. It is bringing about efficiency and preparedness which would be impossible under the former system, because the Chief of the Bureau of Navigation, with the various duties of his bureau, could not give his entire time and thought to questions of strategy and operations of the fleet.

AID FOR PERSONNEL.

The aid for personnel is instrumental in coordinating the work of the Bureau of Navigation, the Bureau of Medicine and Surgery, the Marine Corps, the Offices of Naval Militia, Naval Reserve, Aviation, Radio Telegraphy, and of the Judge Advocate General, and he, together with the other aids, advises the Secretary as to the assignments of the higher ranking officers.

AID FOR MATERIAL.

The aid for material occupies one of the important positions. Grouped in what is now designated as the Division of Material are the important technical and material bureaus of the department; bureaus charged with the design, construction, repair, provisioning, and upkeep of both the sea and shore establishment of the Navy. These several bureaus, having clearly defined duties, experience no difficulty in the execution of the various details wholly under their cognizance, but numerous problems arise which require the coordinated efforts of two or more bureaus, reconciling different recommendations and ideas, and it is the duty of the aid for material to study such cases from the

broad viewpoint of the requirements of the Navy as a whole and to advise the Secretary accordingly. He acts, as it were, as a referee, the final decision resting with the Secretary.

In matters pertaining to one bureau alone the Secretary naturally looks to the chief of that bureau as his legal and responsible adviser.

Informal conferences between the aid for material and the chiefs of the material bureaus have greatly expedited the transaction of business and have resulted in less paper work and fewer delays.

In addition, the aid for material, being a member of the General Board, has labored to coordinate the work of that board and the work of the technical bureaus of the material division. His efforts are often directed toward presenting the views of the bureaus to the board on subjects of importance in order to make practicable conditions conform to theoretical requirements.

AID FOR INSPECTIONS.

The aid for inspections is specially charged with the supervision of the work of the two permanent departmental inspection boards, the one for ships and the other for shore stations. It is his duty to bring to the attention of the Secretary defective conditions from a military point of view believed to obtain in the Navy as to personnel and material, afloat and ashore, and to make such recommendations in the premises as conditions appear to justify.

The determination of the necessity for repairs to ships, and the advisability of making alterations at great expense to modernize ships, which by reason of age have lost much of their military value, or of retaining on the Navy list at considerable cost for maintenance vessels which have become obsolete or worthless for naval purposes, form part of the duties of this office, all of which make for efficiency and economy of administration.

AIDS RECOMMEND ASSIGNMENTS OF FLAG OFFICERS AND CAPTAINS.

The duty of recommending to the Secretary the assignments to important duty of the higher ranking officers of the Navy, the rear admirals and captains, has also been turned over to the full Council of Aids. They review the records of officers, and from their combined personal knowledge the Secretary is enabled to make appointments that will insure general service efficiency.

The subject of the assignment to duty of these two grades of officers is one of the most important in the Navy, and such assignments should be made only after taking into consideration the professional recommendations made by a number of experienced officers of mature judgment.

REGULAR MEETINGS OF COUNCIL OF AIDS.

In order that the Secretary may have subjects of importance thoroughly considered before the final recommendation comes to him, the aids meet in full council daily and take up questions of departmental policy, general orders and changes in regulations, and submit recommendations on those that require action by the department.

Further, the Secretary and his Council of Aids meet at least once a week, at which times he presents to them such subjects as he wishes them to consider.

BUREAU CHIEFS AND AIDS MEET WITH SECRETARY MONTHLY.

The bureau chiefs confer freely with the Secretary whenever any matter arises that affects their particular bureaus. In order that they may have opportunity to present any subject for general discussion, a regular meeting of all the bureau chiefs and aids is held on the first Monday of each month in the Secretary's office.

The chiefs of bureaus have consistently endeavored to carry out the various details of the organization and have been actuated by the spirit of efficiency and economy that has pervaded the present administration. I desire to accord to them and to the aids full measure of praise for all that has been accomplished through their efficient cooperation.

RECOMMENDATION.

Last year I recommended that the four aids be legalized, and now renew this recommendation. The usefulness of the aids in securing economical results and good administration in the Navy Department is beyond question.

MEETINGS OF COMMANDANTS.

In order to standardize the work of the navy yards, quarterly meetings of the commandants on each coast have been inaugurated, and for a similar purpose annual meetings of all commandants, the aid for material and the director of navy yards are held at Washington. These meetings are of immense importance, and are producing like procedure in standard operations in all the yards and a resultant increase in efficiency with a reduction of cost of work due to general adoption of the best details of each yard.

RESULTS.

The present organization of the Navy Department can be best judged by the satisfactory conditions existing to-day, for the business of the Navy is now being conducted with a minimum expenditure while maintaining the highest efficiency of the fleet.

An increase in tonnage, personnel, and activities can be maintained only by a proportionate increase in available funds, and from now on the Congress should be prepared to grant such reasonable increases in appropriations as the demands for a growing Navy may require.

COUNCIL OF NATIONAL DEFENSE.

What the Navy is striving for is to get the highest possible efficiency and preparedness for war. It is felt that a council of national defense will be an additional benefit to the Navy and to the Nation. It will in a way be a vehicle between the department and Congress.

In order to have success, there must be efficiency. To have efficiency, there must be a definite policy; to bring about a definite policy, there must be cooperation and coordination of Congress, the Army, and the Navy. To obtain this cooperation, there must be an intelligent understanding between the legislative and the executive authorities.

The proposed council of national defense should be made up of two Cabinet officers, four Senators, four Congressmen, two Army officers, and two Navy officers. It would seem that this council would tend toward and result in a better understanding and in a definite policy.

The passage of a bill creating the council of national defense is strongly urged, as the establishment of this council will have far-reaching and beneficial effects.

BUREAU OF EQUIPMENT.

The present method of handling the appropriations formerly under the cognizance of the Bureau of Equipment is both illogical and unbusinesslike.

The books of the Bureau of Supplies and Accounts are kept open for two prior fiscal years, and under the present distribution of the duties of the Bureau of Equipment among the various bureaus it is necessary to maintain accounts under each bureau, a total of 40 accounts. This number can be reduced over half if the bureau is abolished and a clean appropriation made.

The necessity for keeping all these different accounts has resulted in confusion and misunderstanding as to the cognizance of various items of expenditure, and has caused a large amount of additional correspondence. This confusion is reflected in requisitions prepared on board ship and elsewhere in that articles chargeable to two or more separate "allotments" are frequently placed upon a single requisition.

COMMERCIAL PRACTICE FOLLOWED IN ASSIGNING EQUIPMENT ELECTRICAL DUTIES.

Electricity is becoming a great motive power. The General Electric Co. is working out new designs for the use of electricity in connection with turbines, and it is important that in the machinery

departments, both ashore and afloat, our officers should be experts in this line of work.

The Vickers Co., England's largest shipbuilding concern, successful not only in the ships it builds, but in its returns to stockholders, indicating great efficiency and economy, has found it advantageous to group electricity and steam engineering together.

The practice coincides with what the department adopted here. Everything points to the increased use of electricity as a motive power for the engine room of the future; therefore it would be illogical to place the design, installation, care, and maintenance of electrical machinery elsewhere than in the hands of officers who are charged with its operation and upkeep under actual service conditions at sea. This is particularly evident after three years' successful experience since the transfer of electrical work from Equipment to Steam Engineering.

RECOMMENDATION.

To effect the principal changes found necessary it is recommended that the Bureau of Equipment be abolished, and that the Secretary be authorized to distribute its duties among other bureaus.

The department wishes to distribute the duties of the Bureau of Equipment as follows: Coal and its transportation, to Supplies and Accounts, with certain other minor matters; electric generators and accessories, electrical signal apparatus, and wireless-telegraph outfits, to the Bureau of Steam Engineering; chain and anchor manufacture, rope making and rigging of wire or rope, canvas work, galleys and fittings, and flags and bunting, to Bureau of Construction and Repair; and the Naval Observatory, Hydrographic Office, and Compass Office, to the Bureau of Navigation. It has been recommended by preceding Secretaries, the only question at issue being the assignment of *equipment* electricity.

There is no evidence that another bureau for electrical work will be required, as the electrical duties of the old Bureau of Equipment have been satisfactorily handled for three years by the Bureau of Steam Engineering. Further, the tendency is to consolidate wherever possible so as to increase economy and efficiency.

OFFICE SPACE REQUIRED BY THE NAVY DEPARTMENT.

The Navy Department and Marine Corps now occupy 68,860 square feet of floor space in the State, War, and Navy Department Building and 49,504 square feet of floor space in the Mills Building and annex, which results in a division of the bureaus on different floors and in different buildings in such a manner as to cause unavoid-

able delay in the transaction of business. No thorough economy of time and expense can be expected until the Navy Department has additional office space, so that the different bureaus and offices can be properly grouped for the economical transaction of business. Should the State Department move into new quarters, the whole south side of this building should be turned over to the Navy Department.

THE FLEET.

ATLANTIC FLEET.

Throughout the fiscal year the Atlantic Fleet has been under the command of Rear Admiral Hugo Osterhaus, and exercises, maneuvers, and fleet training have been carried forward in a very satisfactory manner. In the summer of 1911 the fleet based at Cape Cod Bay for several months, and the following winter made the usual visit to Guantanamo Bay. Target practice, docking periods, divisional cruising, and opportunities for granting liberty and leave to officers and men were scheduled so as to occupy the intervals between these two periods, and it is felt that the year has resulted in decided added efficiency of the fleet. Advantage has been taken of opportunities on long passages to exercise the fleet, with all auxiliaries, in strategical exercises and war games on a larger scale than ever before.

No foreign cruises were made by the fleet during the year. One squadron had the pleasure of welcoming the German vessels that called at Hampton Roads and New York in June, in return for the visit of the second division of our fleet to Kiel one year before.

In the latter part of May it became necessary to employ one squadron of the fleet in the waters of Cuba and vicinity because of the disturbed conditions existing in that Republic, but fortunately by the end of June conditions had so improved as to permit their release and return to their usual exercises.

PACIFIC FLEET.

The Pacific Fleet, consisting of two divisions of armored cruisers, three in the first division and two in the second, was under the command of Rear Admiral Chauncey Thomas until March 7, 1912. On that date, Rear Admiral W. H. H. Southerland assumed command, the *West Virginia* being detached and placed in reserve, due to shortage of personnel, and the remaining four vessels united in one division.

The early part of the fiscal year was spent by the Pacific Fleet in overhauling, docking, target practice, and the usual cruising and

exercises on our own coast, but in November conditions made it appear desirable for it to base at Honolulu, and the fleet sailed from San Francisco for that place on November 21. Some three and one-half months were spent in that vicinity, visits being made to the surrounding islands, and drills and exercises carried out at sea, with Honolulu as a base.

On March 18 these vessels sailed for the naval station, Olongapo, P. I., and operated in that vicinity until the latter part of June, when a cruise to China and Japan en route home was started.

SPECIAL OPERATIONS IN CENTRAL AMERICAN WATERS.

The Navy and Marine Corps have taken a conspicuous part in Nicaragua during the revolution that started in that country on July 29, 1912, and have performed most valuable services in protecting the lives and property of American citizens and other foreigners in that country.

When the revolution broke out under Gen. Mena the *Annapolis* was performing the usual routine duties on the west coast of Central America, and proceeded promptly to Corinto. A few days later, upon the recommendation of the President of Nicaragua, conveyed through the American legation, a force of about 100 bluejackets was sent on August 4 from the *Annapolis* to Managua, the capital, which force protected American citizens and acted as a legation guard during the ensuing bombardment of Managua by the revolutionists.

Meanwhile, it became advisable to send the *Tacoma* to Bluefields, on the east coast of Nicaragua, and this vessel remained there from August 6 to October 19, a landing force of about 50 men being ashore most of this time to insure protection of American life and property in case of disorder.

Also a force of 350 marines from the Canal Zone was brought north in the collier *Justin* and at once proceeded to Managua, arriving there on August 15 and reenforcing the legation guard. Their arrival produced an excellent effect and was much appreciated by the Nicaraguan Government and all foreigners.

On August 10 the *Denver* was diverted from a projected cruise to the Mexican coast and ordered to Nicaragua, and affairs continued to grow so serious, with increasing menace to the railroad and other American properties, that on August 21 it was decided to send an additional regiment of marines and the armored cruiser *California* to the scene. The *Glacier*, with provisions, and the *Prometheus* and *Saturn*, with coal, were also dispatched there, followed finally by the *Colorado* and *Cleveland*, thus bringing the force to a satisfactory strength for keeping open communication with Managua and Granada, for protecting the lives and property of Americans and other foreigners, and for maintaining an adequate legation guard.

The commander in chief of the Pacific Fleet arrived at Corinto on August 28 and took complete charge of military affairs in the western part of Nicaragua, controlling the land operations of the bluejackets and marines as well as the duties performed by the ships in patrolling the coast and preventing filibustering. The *Cleveland* reached Corinto September 14, being the last ship to arrive there, and her landing force was at once sent ashore, bringing the number of bluejackets and marines ashore in Nicaragua to a total of about 2,350.

These combined forces were diligently and expeditiously employed in opening the railroad from Corinto to Managua, and later to Granada, and it is certain that their effective services assisted immeasurably in restoring tranquillity in Nicaragua and in relieving the deplorable conditions of privation and hunger that resulted in several localities from the operations of the rebel forces.

Unfortunately it became necessary to use armed force in order to dislodge a band of revolutionists from the Barranca, a fortified position consisting of two hills near Masaya, between which the railroad passes, and from which the revolutionists controlled and threatened the railroad and held Masaya in a state of pitiable destitution. A short but gallant assault succeeded in overcoming the resistance; in the assault four of our men were killed and five wounded. This occurred on October 4, and on the same day five marines were slightly wounded in a skirmish at Chichigalpa. On October 6, while an American detachment was entering Leon to occupy the town, some resistance was encountered, and our loss amounted to three killed and three wounded.

The loss of seven killed is most deplorable, but the operations in which these lives were sacrified were necessary in fulfilling the very evident obligations of this Government, and it is doubtful if the results in the interest of humanity could otherwise have been obtained. With the surrender of Gen. Mena to Admiral Southerland and his deportation from the country, followed by the death of Gen. Zeledon, the revolutionary movement quickly subsided, and by the latter part of October practically normal conditions obtained throughout the country, although it was deemed prudent by our Government to keep a considerable force ashore at various important centers until after the presidential elections in Nicaragua in November.

The department feels gratified over the success attending this carefully planned campaign, and has noted with pleasure that the forces of the Navy and Marine Corps engaged in these operations ashore, under frequently very trying conditions, have by their conduct lived up to the best traditions of the Naval Service.

These operations again demonstrated the necessity for properly designed and equipped transports for the use of the Navy.

ASIATIC FLEET.

The Asiatic Fleet, under the command of Rear Admiral Joseph B. Murdock, throughout the fiscal year, continued the usual operations on that station in safeguarding American interests. Particularly during the revolution in China in the winter of 1911 and 1912 very valuable services were rendered, and all available vessels, including the destroyers, were concentrated in Chinese waters at this critical period. Rear Admiral Reginald F. Nicholson succeeded Rear Admiral Murdock in July of this year. In accordance with the policy of the department that extensive repairs be made at the home yards, the *New Orleans* returned to the navy yard, Puget Sound, being relieved by the *Cincinnati* on the Asiatic station. The submarines of the Asiatic Fleet made a very successful cruise to the Southern Philippine Islands in April, 1912.

ATLANTIC TORPEDO FLEET.

The Atlantic Torpedo Fleet of destroyers and submarines continued their most valuable and instructive exercises in developing the offensive and defensive tactics of these useful craft, working in conjunction with the Atlantic Fleet whenever opportunity offered. This fleet ceased to exist as a separate organization in March, 1912, when the destroyers, with their tender, were attached to the Atlantic Fleet as the Torpedo Flotilla thereof, and nine submarines and their three tenders were constituted as the Atlantic Submarine Flotilla, a separate organization, which, however, will be attached to the fleet whenever joint exercises are possible.

It is intended to place the combined torpedo and submarine flotillas in the fleet under the immediate command of a rear admiral.

PACIFIC TORPEDO FLEET.

The Pacific Torpedo Fleet, consisting of 12 destroyers and torpedo boats and 2 submarines, with tenders, also carried out tactical and strategical exercises of an advanced nature, and valuable information was obtained from their operations. Unfortunately shortage of personnel rendered it necessary to place the majority of these vessels in reserve, so that at the end of the fiscal year only one group of five destroyers remained in active service, together with two new submarines that took the place of the two older ones placed in reserve.

UNATTACHED VESSELS IN ACTIVE SERVICE.

Vessels of the Navy in active service, but not attached to fleets, have continued varied operations in protecting American interests in disturbed districts of South America, Central America, and the West Indies, in surveying work, and in other forms of service not consist-

ent with the character of vessels comprising the organized fleets. The Naval Academy practice squadron visited Kiel, Bergen, and Gibraltar, after calling at Queenstown, at the end of the preceding fiscal year.

MOVEMENTS OF INDIVIDUAL VESSELS.

The movements of all vessels of the Navy during the fiscal year are published in a separate pamphlet.

THE MOBILIZATION.

The fleets are in a more efficient condition than ever before. Last year the custom of mobilizing the fleet annually was inaugurated to furnish an ocular demonstration of the preparedness and efficiency of the organizations both in the fleet and in the navy yards. The second mobilization of the Atlantic Fleet was held this year in North River, N. Y., and simultaneously there was a mobilization of the Asiatic Fleet in Manila Bay. Complete arrangements were made to have the Pacific Fleet mobilized at San Francisco, but owing to the absence of many of the vessels on special service it was necessary to cancel the arrangements.

On October 14 the ships assembled at New York were inspected in the forenoon by the Secretary of the Navy. In the afternoon of the same day the President inspected the fleet, and on the following day reviewed it as the ships passed out of the harbor in fleet formation.

Mobilization of Atlantic Fleet at New York.

Battleships:	Displacement (tons).
Connecticut (flag)	16,000
Arkansas	26,000
Wyoming	26,000
Florida	21,825
Utah	21,825
Delaware	20,000
North Dakota	20,000
Michigan	16,000
South Carolina	16,000
Louisiana	16,000
Vermont	16,000
New Hampshire	16,000
Kansas	16,000
Minnesota	16,000
Idaho	13,000
Georgia	14,948
Virginia	14,948
Nebraska	14,948
New Jersey	14,948
Rhode Island	14,948
Missouri	12,500
Ohio	12,500
Maine	12,500
Illinois	11,552
Wisconsin	11,552
Alabama	11,552
Kearsarge	11,520
Kentucky	11,520
Battleships:	Displacement (tons).
Iowa	11,346
Indiana	10,288
Massachusetts	10,288
Total (31)	478,508
Armored cruisers:	
Tennessee	14,500
Montana	14,500
Washington	14,500
North Carolina	14,500
Total (4)	58,000
Cruisers:	
Salem	3,750
Birmingham	3,750
Chester	3,750
Baltimore	4,413
Total (4)	15,663
Destroyers:	
Smith	700
Lamson	700
Flusser	700
Preston	700
Reid	700
Paulding	742
Drayton	742
Roe	742

Destroyers:	Displacement (tons).
Terry	742
McCall	742
Perkins	742
Sterett	742
Walke	742
Ammen	742
Burrows	742
Monaghan	742
Patterson	742
Trippe	742
Fanning	742
Jouett	742
Beale	742
Jenkins	742
Worden	433
Macdonough	400
Total (24)	16,947

Gunboats:	
Nashville	1,371
Petrel	890
Dolphin	1,486
Total (3)	3,747

Torpedo boats:	
Tingey	165
Craven	146
Shubrick	200
Thornton	200
De Long	196
Stockton	200
Dahlgren	146
Bailey	280
Bagley	175
Barney	175
Biddle	175
Stringham	340
Porter	165
Blakely	196
Dupont	165
Morris	105
Total (16)	3,029

Submarines:	
C 1	
C 2	
C 3	
C 4	
C 5	
D 1	
D 2	
D 3	
E 1	
E 2	
Total (10)	

Naval Militia vessels:	
Machias	1,177
Marietta	990
Vixen	806
Gloucester	786
Wasp	630
Aileen	192
Total (6)	4,581

Special type:	
Dixie (tender)	6,114
Castine (tender)	1,177
Severn (tender)	1,175
Tonopah (tender)	3,225
Mayflower (converted yacht)	2,600
Yankton (converted yacht)	975
Celtic (supply ship)	8,000
Culgoa (supply ship)	6,000
San Francisco (mine layer)	4,083
Lebanon (ammunition ship)	3,285
Panther (repair ship)	3,380
Solace (hospital ship)	5,700
Montgomery (torpedo practice ship)	2,072
Sonoma (tug)	1,120
Ontario (tug)	1,120
Patapsco (tug)	755
Patuxent (tug)	755
Total (17)	51,626

Fuel ships:	
Orion	19,132
Cyclops	19,360
Sterling	5,663
Vulcan	11,230
Hector	11,230
Cæsar	5,920
Brutus	6,600
Ajax	9,250
Total (8)	88,385

SUMMARY.

Battleships (31)	478,508
Armored cruisers (4)	58,000
Cruisers (4)	15,663
Special type (17)	51,626
Gunboats (3)	3,747
Naval Militia vessels (6)	4,581
Destroyers (24)	16,947
Torpedo boats (16)	3,029
Submarines (10)	
Fuel ships (8)	88,385
Ships of all classes (123)	720,486

COMPARISON OF FORCES MOBILIZED, 1911 AND 1912.

At the mobilization of the United States Atlantic Fleet at New York, in 1911, there were 24 battleships, 2 armored cruisers, and 72 smaller vessels, representing a total displacement of 576,634 tons. There were 1,124 officers and 25,378 enlisted men of the Navy and Marine Corps attached to these vessels.

During the review held at New York from the 12th to the 15th of October, 1912, there were 31 battleships, 4 armored cruisers, and 88 smaller vessels, representing a total displacement of 720,486 tons. There were attached to these vessels 1,300 officers and 27,464 enlisted men of the Navy and Marine Corps.

Recapitulation.

	1911	1912	Increase.
The fleet:			
Battleships	24	31	7
Armored cruisers	2	4	2
Smaller vessels	72	88	16
Displacement (tons)	576,634	720,486	143,852
Personnel:			
Officers	1,124	1,300	176
Enlisted men	25,378	27,464	2,086

MOBILIZATION OF ASIATIC FLEET.

Simultaneously with the mobilization of all available vessels in the Atlantic at New York there was held a similar mobilization at Manila of all vessels that could be assembled there.

After reviewing the fleet the President made the following comment:

THE PRESIDENT'S COMMENT.

"My inspection of the mobilized fleet and a comparison with the force assembled last year assure me that the Navy is now in a decidedly stronger and more efficient condition than a year ago. There are assembled to-day 123 vessels, in place of 98 in 1911, an increase in the gross tonnage of 150,000 tons, showing a far greater percentage of vessels actually ready for immediate service. This is a direct result of the reorganization which has increased the efficiency of the Navy by cooperation of all the departments and officers of the fleet.

"It has been very gratifying to me to see the interest shown by the Naval Militia, and I am delighted with their military and naval aspect. The reserve fleet also shows a quick asset to the Navy in time of need.

"The presence in New York to-day of the vast concourse of citizens from all over the United States is further evidence that the country at large is enthusiastically in favor of our Navy.

"The widespread interest throughout the United States in this mobilization will undoubtedly have a beneficial effect in leading young men to consider more carefully the many advantages to be derived from enlisting in the Navy, while those of the Navy present on this occasion will be stimulated in their work and rendered still more zealous by the visible display of the potential strength of the military arm in which they are serving.

FLEET PREPARED FOR BATTLE.

"I can not forbear to congratulate the Secretary of the Navy and the officers and men of the fleet on the magnificent appearance which in this grand review of these two days the fleet presents. I am sufficiently advised of the preparedness of the vessels to know that when they pass me to-morrow in front of the Statue of Liberty, they would be ready to meet an enemy outside of Sandy Hook, both those vessels on the active list and those on the reserve, with their guns shotted and ammunition enough in store to do effective battle for their country.

"The Secretary of the Navy has consistently labored to bring about a system of control in the Navy Department which shall be military rather than civil, and directed to fighting rather than merely to manufacture and industrial work. A navy is for fighting, and if its management is not efficiently directed to that end the people of this country have a right to complain. The institution of naval aids to the Secretary, resembling in some respects the General Staff of the Army, has brought about a condition adapted to a quick preparation of fighting units and a quick mobilization of squadrons and fleets that never has been posssible before in the history of that department.

"It is true that there are needed more auxiliary vessels than we now have were we to enter upon a war of large proportions, but it is satisfactory to know that the time in which such auxiliary vessels could be prepared is not prohibitive, and is much less than would be needed to add battleships. I sincerely hope that whatever party comes into power the policy of two battleships a year will be continued until, through the Panama Canal and otherwise, the needs of the Pacific coast for its defense shall be satisfied and our people whose States abut on that great ocean may feel that they, too, are receiving the benefit of the sums expended from the National Treasury for adequate naval defense.

THE NAVY AN INSURANCE.

"Of course no one of us desires to have battleships merely for the pleasure of feeling a power to control other nations. No one wishes

battleships for the purpose of promoting war or leading to international controversy. We provide a navy as we provide insurance, against a possible loss or a danger which we hate to anticipate, but which under present conditions we should be foolish not to treat as possible. I know there are a great many conscientious peace lovers who resent the expenditure of a dollar for a battleship. Their theory is that we can reach a peaceful solution of international contests earlier if we begin the disarmament and make ourselves physically helpless before the nations of the world. They believe that this by way of example will lead other nations to the same course and so ultimately accomplish the purpose of all of us, which is the settlement of all international controversies by peaceful means.

"I differ from these earnest and thoughtful people with great respect for their opinion, but I differ from them none the less. I do not think the world has yet reached a point where advantage would not be taken of our inability to resist attack, or to meet other nations on an equality in war; and I believe that it is essential, in order that we should preserve our prestige, by the exhibition of actual power of resistance and of attack, until through our influence, and with all other nations equally anxious to bring about peace, there shall be substituted some sort of tribunal or court or board of arbitration before which any nation shall be enabled to call in any other nation to answer, and to execute any judgment delivered against it after a hearing."

CHARACTER OF NEW VESSELS AT THE REVIEW.

There were 25 additional vessels at the review this year. Of these, 11 have been completed, commissioned, and added to the active fleet since the date of the last review. Two of these are battleships of 26,000 tons each, four are destroyers, two are submarines, two seagoing tugs, and one fuel ship. All of the above vessels except the submarines were designed in detail by the technical bureaus of the Navy Department, and were built in American shipyards, of American material in all respects.

The two battleships, the *Wyoming* and *Arkansas*, are vessels of 26,000 tons displacement and 21 knots designed speed. Each of them on trial much exceeded the designed speed, and they have been characterized as the fastest battleships in the world. They each carry twelve 12-inch 50-caliber guns in six turrets on the center line, permitting all guns to be fired on a broadside. They are protected by 11 inches of the most efficient armor. These vessels are driven by Parsons turbines with four shafts, and the boilers are fitted to burn both coal and oil. They are to-day the largest battleships in service in any navy, in addition to being the fastest, although larger vessels of this class are building for the United States and also for other navies.

Both the *Wyoming* and *Arkansas* were constructed in less than three years from the date of contract to date of actual commissioning ready for mobilization, and but two years and eight months elapsed between the laying of their keels and their final completion.

The new torpedo-boat destroyers are oil burning, of the type which has been developed so successfully for the United States Navy, and are armed like the class immediately previous to them, represented by the *McCall*, *Burrows*, and *Mayrant*. This type of destroyers has shown itself particularly well suited to service conditions, and their seaworthiness and stanchness were more than amply demonstrated since the last review in the severe January hurricane. In the case of the *Warrington*, due to collision with a schooner, some 40 feet of the stern was cut off, including rudder and propellers, and yet the boat was safely brought to port and all on board saved.

The submarines are a development of the submarines previously in use in the United States Navy, with increased displacement, speed, and radius.

The seagoing tugs are specially designed for use at target practice and for tenders to the fleet, requiring unusually rugged and seaworthy craft.

The new collier is of the general type of the *Cyclops*, specially designed for fleet work in peace and war, and for handling at maximum rates large volumes of coal for the ships of the battle fleet. This type of vessel, of which there are now seven built or building, carries 14,000 tons of cargo and bunker fuel. They have proven eminently successful, and in the recent visits of United States squadrons to foreign waters attracted much attention and favorable comment.

SUCCESS OF THE MOBILIZATION DUE TO PRACTICAL BUSINESS METHODS IN THE NAVY.

Of the 14 older vessels presented at this review and not present at the review of 1911 all were then overhauling. They are now completed and ready for service.

Four of the vessels present had only recently received serious damages—*New Hampshire*, *Beale*, *Walke*, and *Porter;* but the repairs were taken in hand immediately and pushed to completion, so that all were present. The ships in the reserve fleets, ranging from battleships and cruisers at Portsmouth and Philadelphia down to torpedo boats and submarines at Charleston, were shown to be in readiness, as is evidenced by the fact that they sailed for the mobilization at the appointed time, fit for any duty. The large amount of work undertaken at such times, and the variety of the same, has to be fully understood to appreciate what was accomplished in the planning, laying out, and carrying this work to completion.

To secure the presence of this vast fleet an immense amount of work on the part of the administrative and the material branches of the service was required.

To the coordinated efforts of the technical bureaus of the Navy Department and the hearty and successful response of our navy-yard organizations to the demands made upon them is due to a very great degree the credit for the consummation of this mobilization.

Ships out of service through various causes have been thoroughly overhauled and modernized and are now present either in the active fleet or attached to the mobile reserve.

Conscious ever of the fact that navy yards are for the purpose of serving the fleet, no better example of their worth can be given than the work that they have so successfully accomplished in recent years.

RESERVE FLEETS.

As the result of consistent effort and in accordance with the plans outlined in my last annual report, it has been possible to create and actually organize reserve fleets on the Atlantic and Pacific coasts.

These two fleets, possessing an important military value, are maintained in a state of material readiness, and would in time of war or emergency constitute our second line of defense.

The Atlantic Reserve Fleet was established at the navy yard, Philadelphia, Pa., on May 1, 1912, under Rear Admiral Austin M. Knight as commander in chief. The Pacific Reserve Fleet was established at the navy yard, Puget Sound, Wash., on March 25, 1912, under Rear Admiral Alfred Reynolds as commander in chief. The composition of these fleets on July 1 was as follows:

1. The Atlantic Reserve Fleet and other vessels available for assignment thereto:

Battleships:
- Indiana.
- Massachusetts.
- Iowa.
- Kearsarge.
- Kentucky.
- Wisconsin.
- Illinois.
- Alabama.
- Maine.

Armored cruisers:
- Tennessee.
- Montana.
- North Carolina.
- Washington.

Scouts:
- Birmingham.
- Chester.
- Salem.

Cruisers:
- Baltimore.
- Olympia.
- Tacoma.
- Des Moines.
- Chicago.
- Machias.

Colliers:
- Vestal.
- Neptune.
- Leonidas.

Destroyers:
- Macdonough.
- Worden.

Torpedo boats:
- Craven.
- Dahlgren.
- De Long.
- Shubrick.

Torpedo boats—Contd.
- Stockton.
- Thornton.
- Tingey.
- Wilkes.
- Stringham.
- Bailey.
- Biddle.
- Bagley.
- Barney.
- Blakely.
- Du Pont.
- Morris.
- Porter.

Submarines:
- A–1.
- B–1.
- B–2.
- B–3.

On July 1 these vessels were assembled at the following yards:

(*a*) At Philadelphia "the Atlantic Reserve Fleet" proper, under the command of Rear Admiral Knight as commander in chief, and consisting of the battleships *Indiana*, *Massachusetts*, *Iowa*, *Kearsarge*, *Wisconsin*, and *Maine*, the armored cruisers *Tennessee* and *Montana*, the scouts *Birmingham* and *Chester*, and the collier *Vestal*.

(*b*) At Charleston, S. C., the Reserve Torpedo Flotilla, consisting of the cruisers *Baltimore* and *Olympia*, and the torpedo boats, destroyers, and submarines *Macdonough*, *Worden*, *Craven*, *Dahlgren*, *De Long*, *Shubrick*, *Stockton*, *Thornton*, *Tingey*, *Wilkes*, *A–1*, *B–1*, *B–2*, and *B–3*.

(*c*) At Annapolis, a Reserve Torpedo Flotilla, consisting of the *Stringham*, *Bailey*, *Biddle*, *Bagley*, and *Barney*.

(*d*) All remaining vessels were at navy yards awaiting their transfer to Philadelphia or were engaged on special duty.

The Pacific Reserve Fleet and other vessels available for assignment thereto.

Battleship, Oregon.	Cruisers—Continued.	Torpedo boats:
Armored cruisers:	Denver.	Fox.
Pennsylvania.	Cleveland.	Davis.
West Virginia.	Raleigh.	Farragut.
Cruisers:	Marblehead.	Rowan.
St. Louis.	Destroyers:	Submarines:
Milwaukee.	Paul Jones.	A–3.
Charleston.	Hopkins.	A–5.
Chattanooga.	Truxtun.	Fortune (tender).
Galveston.	Lawrence.	Monitor, Cheyenne.

On July 1 these vessels were assembled at the following yards:

(*a*) At Puget Sound, Wash., the "Pacific Reserve Fleet" proper, under the command of Rear Admiral Reynolds as commander in chief, and consisting of the following vessels: The battleship *Oregon*, armored cruisers *Pennsylvania* and *West Virginia*, cruisers *St. Louis*, *Milwaukee*, *Charleston*, *Raleigh*, *Chattanooga*, and *Galveston*, monitor *Cheyenne*, torpedo boats *Fox* and *Davis*, and submarines *A–3* and *A–5*.

(*b*) At Mare Island, cruisers *Denver*, *Cleveland*, destroyers and torpedo boats *Paul Jones*, *Truxtun*, *Hopkins*, *Lawrence*, *Farragut*, and *Rowan*, and the *Marblehead*, now on special detail.

The ships of these fleets are in commission with reduced personnel, but are ready for sea as regards material, and they are governed by regulations and routine carefully drawn to keep them in constant readiness for sea. These ships will make a short cruise each year during which full-power trials and target practice will be held and will be prepared either to replace ships in the first line or to form a powerful and efficient coast defense.

The ships of these two reserve fleets have been created from what was two years ago a scattered lot of unserviceable and uncommis-

sioned vessels. Without in any way neglecting the active fleet, we have been able to complete the work on practically every vessel heretofore "in ordinary."

As an example of the preparedness of the Reserve Fleets the *Tennessee* and *Montana* were ready to sail on November 11, 1912, on the voyage from Philadelphia to the Mediterranean about 72 hours after receiving orders.

PREPAREDNESS OF THE FLEET AS REGARDS REPAIRS.

The preparedness of the fleet as regards repairs and upkeep has been maintained at a most satisfactory standard, and the ships of the Navy, irrespective of their classes, have been generally in a condition to respond to the many calls that have been made upon them.

This gratifying condition has been brought about through several coordinated methods:

(*a*) The development of a spirit of self-dependence, and the ability on board every ship to be self-sustaining to the maximum possible degree.

(*b*) The establishment of and adherence to routine docking and repair periods.

(*c*) The standardizing of major changes and alterations; approvals and authorizations being made equally applicable to all vessels of a class.

(*d*) The use of fleet auxiliaries.

(*e*) Improvement in yard methods; the employment of a steady force of highly trained and efficient mechanics and workmen.

Vessels of the Navy ready for service and those undergoing extensive repairs at the end of certain calendar years.

Class of vessel.	1909		1910		1911		1912	
	In active service or ready.	Repairing.	In active service or ready.	Repairing.	In active service or ready.	Repairing.	In active service or ready.	Repairing.
Battleships	17	10	18	11	26	5	33	None.
Armored cruisers	10	.....	10	.....	8	2	9	1
Cruisers	13	14	13	14	20	7	22	5
Gunboats	33	5	34	2	33	1	31	2
Colliers	19	4	17	2	21	1	20	None.
Destroyers	9	11	18	9	35	.....	32	8
Submarines	12	6	8	10	17	3	19	4
Total	113	50	118	48	160	19	166	20

NOTE.—Four battleships are scheduled for three months' routine overhaul during the period January 1 to March 31

The department issued, on April 1, 1912, a schedule of overhaul periods for the battleships, covering a period of one year. This, like the fleet itinerary, is subject to variations due to unforeseen circumstances, but every effort is made to carry out this schedule, as it pro-

vides for a uniform flow of work at the yards, keeps 17 battleships in cruising condition, with 4 overhauling at the yards, and adds to the contentment and consequent efficiency of the personnel in having definite plans of employment published in advance.

PROPOSED NEW CONSTRUCTION.

PREVENTION OF WAR.

That international efforts toward peace have accomplished nothing as to the limitation of armaments needs no argument.

If an efficient fleet of adequate size is maintained the country will be safe from attack and free to work out its destiny in peace and without hindrance. The recommendation for a continuing policy which will give the fleet desired is made with due regard for the almost world-wide movement for the settlement of international disputes by arbitration, in which movement this country has taken a foremost part. History of all times, including the present, shows the futility and danger of trusting to the good will and fair dealing, or even to the most solemnly binding treaties, between nations for the protection of a nation's sovereign rights and interests, and, without doubt, the time is remote when a comparatively unarmed and helpless nation may be reasonably safe from attack by ambitious, well-armed powers, especially in a commercial age such as the present. The economical system of a great commercial nation is so delicately balanced that even a threat of war is very disturbing and harmful, while a war with any other great power would cause incalculable damage. To avoid war and insure peace the country must be prepared for war.

No person of intelligence who has studied international policies can be blind to the fact that the possession of great wealth, resources, and population does not carry with it immunity from attack should a nation's interests clash with those of another better prepared.

"*Experience has shown the wisdom of systematic preparation for war. If we wait until a crisis comes, it is then too late to make effective preparations, and the result is confusion, waste, and unnecessary loss of life.*

"*In any war involving the United States the control of the sea will be of the utmost and deciding importance. Such control can be obtained only by an efficient Navy of sufficient strength.*"

WASHINGTON'S WORDS.

"The United States ought not to indulge a persuasion that, contrary to the order of human events, they will forever keep at a distance those painful appeals to arms with which the history of every other nation abounds. *There is a rank due to the United States among nations which will be withheld, if not absolutely lost, by the*

reputation of weakness. If we desire *to avoid insult, we must be* able to repel it; if we desire to secure peace, one of the most powerful instruments of our rising prosperity, it must be known that we are at all times ready for war."

RELATIVE STANDING OF NAVAL POWERS.

Nowadays only so-called dreadnoughts and battle cruisers are considered in estimating naval strength. These are called capital ships, and in a few years, if the powers do not increase their present programs, and if the Congress authorizes only two capital ships every year, the United States will have dropped from *second to fourth* on the list.

THE CANAL DOES NOT DOUBLE THE FLEET.

It has been erroneously stated that the canal will double the fleet. It will increase the efficiency of the fleet somewhat because if the fleet is on this side it will reduce the time necessary to bring it around to the Pacific coast, but it does not increase the number of ships.

The canal does double the power of the fleet in some respects when it permits of transferring the fleet from one side to the other, but this is a condition that has been fully considered whenever the subject of present and future naval strength has been under discussion by the naval experts.

With an immense coast line, and with the whole of South and Central America to separate the east from the west coasts, this country would otherwise need double the fleet of a country whose coast line is continuous.

In times of peace it is pointed out that there will be no more wars, but history shows that wars come at times with little or no warning. There is no time left to build battleships, and it is impossible to buy them. Congress should provide the auxiliaries, destroyers, etc., that go with the battleship fleet, but when war comes the auxiliaries will not go out and sink the battleship fleets. Only battleships can do this work.

A CONTINUING ANNUAL BUILDING PROGRAM NECESSARY.

A total of 41 battleships, with a proportional number of other fighting and auxiliary vessels is, in the opinion of the Secretary, the least that will place this country on a safe basis in its relations with other world powers. This number should be reached as soon as practicable and then the fleet should be kept up to its standard strength by replacing obsolete vessels with new ones by a uniform yearly replacement program.

The mobilization of the fleet demonstrated the need of battle cruisers and of smaller vessels, such as scouts, destroyers, gunboats, submarines, colliers, and ammunition ships.

The department distinctly recognizes the value of torpedo craft and submarines. It would be glad to have more of them, but it is of the opinion that until more of the old battleships are replaced it is wiser to provide for battleships than to sacrifice battleship strength for vessels of less military value.

While only three battleships are included in the estimates for this year, the department feels that the deficiencies of the fleet in other types of ships should be carried out in accordance with the recommendations of the General Board. This board has furnished annually since 1900 a consistent and continuing program.

RECOMMENDATION OF GENERAL BOARD.

The General Board, in pursuance of consistent recommendations since 1900, recommends that provision be made for an increase of the Navy at the coming session of the Congress by the addition of the following new construction:

(a) 4 battleships.
(b) 2 battle cruisers.
(c) 16 destroyers; 1 destroyer tender.
(d) 2 transports.
(e) 1 ammunition ship.
(f) 6 submarines; 1 submarine tender.
(g) 1 supply ship.
(h) 2 gunboats.
(k) 2 seagoing tugs.
(l) 1 dry dock.
(m) 1 submarine testing dock.

NOTE.—The board recommends the conversion of the *Prometheus* into a repair ship, and if this is approved one fuel ship should be provided for the building program to replace the *Prometheus*. It recommends also the conversion of the cruiser *Baltimore* into a mine transport, the *San Francisco*, a sister vessel, converted to this purpose, having proved sufficiently useful to warrant the expenditure necessary to convert the *Baltimore*.

(*a*) *Battleships.*

These will simply replace four battleships, which will be 20 years old in 1914, and will then have to be withdrawn from the second line. They will not constitute a numerical increase in the present strength of the fleet.

(*b*) *Battle cruisers.*

The United States has no vessels of this type. These vessels have a military value not possible to obtain from other types or combinations

of types. To further neglect to provide for them is to deliberately weaken our naval strength.

The paramount need of the Navy is, however, for battleships, and the board does not recommend any modification of the building program by which preference in building is given to battle cruisers or other fleet units, and auxiliaries, which will interfere with the ultimate battleship strength.

(*c*) *Destroyers; destroyer tender.*

Since 1907 the board has consistently advocated the policy of 4 destroyers for each battleship, which is considered essential to a proper balance of the fleet. Tenders in the proportions of 1 to 16 destroyers have become indispensable fleet auxiliaries.

(*d*) *Transports.*

The loss by collision at sea of the steamships *Republic*, *Merida*, *Marcellus*, and *Titanic* has emphasized the urgent necessity for two properly designed and equipped naval transports for use, one on the Atlantic and one on the Pacific coast. The only vessels at present available for such duty are the *Prairie* and the *Buffalo*. The former is now 22 years old and the latter 20. Both are single-bottom ships and entirely lacking in water-tight subdivision, having been originally designed as freighters. They further lack many things absolutely necessary for the health and comfort of officers and men on large expeditions. The embarkation of a force of only 750 men with the necessary impedimenta is attended by the most insanitary crowding. Nevertheless, since the close of the Spanish War these ships have been constantly engaged in transporting men on foreign stations, expeditionary forces of marines, and naval militia. Since 1900 there have been, for instance, no less than 24 expeditionary forces of marines dispatched to various parts of the world. From 1909 to 1911 there were transported in the *Yankee* and *Dixie* a little more than 20,000 men. During 1911 the *Prairie* made seven trips with enlisted men and two with marine regiments. The *Buffalo* made two trips to the Asiatic Station, one trip with a marine regiment and one with naval militia of California.

The need for transports is considered sufficiently urgent to warrant the omission of fuel ships for one year.

(*e*) *Ammunition ship.*

The United States has now only one small makeshift vessel for ammunition-carrying purposes. The construction of others can not longer be delayed with safety. The program contemplates such construction in the ratio of 1 to 8 battleships and 4 battle cruisers.

(f) Submarines; submarine tender.

The submarines contemplated are of what is known as the coast-defense type, whose principal function in war is to insure strategical freedom to the main fleet.

Tenders in the proportions of 1 to about 6 submarines have become indispensable fleet auxiliaries.

(g) Supply ship.

The 3 supply ships now serving the Atlantic and Pacific fleets are more than 20 years old and can not be expected to give much further service. There should be 1 modern supply ship for each 8 battleships.

(h) Gunboats.

The Navy possesses an insufficient number of gunboats to perform effectively the service required of it for the protection of American interests in Central American and West Indian waters, and in the Far East. With one exception, no gunboats other than for river service, have been added to the Navy since 1902. The construction of two gunboats yearly is contemplated in the program.

(k) Seagoing tugs.

There are at present but 4 seagoing tugs available for duty on the Atlantic coast, with 2 under construction. Two are available on the Asiatic Station and 1 on the Pacific. The program contemplates the construction of 4 additional seagoing tugs for service with the fleet on the basis of 1 to 4 battleships.

(m) Submarine testing and wrecking dock.

In view of the increasing number of submarines, and the age of some of the older vessels, there is urgent need also for testing and wrecking docks that may be used for salving submarines of any size; docking submarines; and testing to determine resistance to external water pressure. Two docks of this description will ultimately be required for the Atlantic, and one each for the Pacific coast, Hawaii, Panama, Guam, and the Philippines. The construction of one each year is contemplated in the program.

GUNNERY.

The fleet has maintained its high standard in all branches of gunnery.

The reorganization which has been effected and the establishment of regular periods throughout the year for the accomplishment of

military training, should result in still greater improvement in gunnery and a better condition of preparedness for battle, as well as a greater contentment on the part of the personnel afloat.

The problems given the ships at the times of battle practice are as realistic as possible, having in mind the safety of ships and men, and furnish most valuable experience to all concerned. The competition between ships and divisions is very keen and results in exceedingly high standards, which are continually being improved.

With the improvement in gunnery has also come a marked improvement in preparedness for battle. The rules have been so drawn as to direct thought toward what may be expected in an engagement. Casualties have been simulated and unexpected difficulties have been thrown in the way of the officers controlling the fire, so that they may be prepared for unfavorable happenings.

The methods for making the "approach" when about to engage in battle have been studied and developed as a result of the various battle plans laid down by the department for the actual firing of the guns.

It is demanded that the training should be conducted on the open sea, where the rolling and pitching require the most expert skill on the part of the gun pointers in order to hit the target.

SMALL ARMS.

At the last national rifle match the Navy team won the Thompson trophy cup, the first prize for the United Service match, and the Marine Corps won first place in the national match in competition with 42 other teams.

The Marine Corps was represented on the team from the United States that won the international match recently held at Buenos Aires. The Olympic rifle team, that has just won a notable victory at Stockholm, was commanded by a naval officer and included three representatives from the Navy in its membership.

ENGINEERING COMPETITIONS.

The engineering competitions are now firmly established. During the past year the performance of the vessels has, almost without exception, been highly creditable, both as regards speed and economy. The larger vessels either exceed or fall but slightly below their contract speeds, which, in view of their increasing age, indicates a high state of efficiency and continued attention to details. The new destroyers, without exception, can and do duplicate, and frequently exceed, the speeds made at the time of their delivery to the Government. In the matter of smoke prevention, these oil-burning destroyers have constantly improved, and the entire flotilla can now steam at high speed without any smoke whatever, a fact of the greatest tactical and

strategic importance. The submarines, in carrying out the requirements of the competition rules, have shown high surface and submerged speeds and ability to complete without assistance voyages of appreciable length.

The records show that in matters of economy of fuel the vessels are maintaining high standards. While remarkable improvement on the part of the older vessels can not be expected from year to year, because of the fact that most of the improvement has already been effected, it is significant that these ships are showing no decrease in economy.

These results were produced by the most energetic attention to duty, in which losses and wastes were eradicated in boilers, engines, and auxiliaries, as indeed they must be if a ship is to take creditable stand in the engineering competition. A constant stream of detailed information on designs and operation exists between ships and the department and between the department and ships, so that officers may readily benefit by the experience of others; that good organization and sound practices may become standardized, and that methods of doubtful expediency may be brought under widespread discussion.

Repair initiative, resulting in a vessel's self-sustaining qualification, has received great impetus during the last few years. Ships will never be entirely self-sustaining, this being limited both by necessary lack of large repair facilities and by the short periods of time possible to allow for repairs and alterations. Large savings in time and money in repair work are now the order of the day, and ships undertake their own repairs as a matter of pride and as a matter of course. The well-known resourcefulness of the American mechanic is a large element in this.

REVISION OF SHIP-INSPECTION REPORTS.

The form used for the military inspection of ships has been revised. Its length was voluminous, but it has now been condensed materially by the elimination of superfluous items. At the same time its value has been enhanced by requiring that as far as practicable the report on matters of ordinary routine and general maintenance, and on readiness for emergency, be based upon general observation, or *observation during unannounced visits*, so that the ship's normal condition may be determined rather than her condition under special preparation for an awaited inspection.

STANDARD SHIPS ORGANIZATIONS.

The matter is now in progress of establishing standard systems of organizations for ships, so that all of one design will have the same, and all of one type will have the same general features, and these will

also have as many minor features alike as differences of design will permit. This will enable an active vessel to be replaced by one in reserve or out of commission, transferring officers and crew in a body with a minimum of change of organization, enabling the newly commissioned vessel to take her place in the fleet without delay.

AVIATION.

Although the aeroplane has not yet arrived at the state of perfection required, it is sufficiently advanced to be of great service in many ways, and its satisfactory development for extensive naval use is expected at an early date.

The most serious phase of aviation is that of adequate instruction. It takes longer to produce a sufficient number of competent aerial navigators than to manufacture a sufficient number of aeroplanes.

The following statement will serve to show the comparative interest that is manifested in aviation to-day by some of the powers:

Government appropriation.

France	$6,000,000
Germany	1,500,000
Russia	5,000,000
Great Britain	2,100,000
Italy	2,000,000
Japan	600,000
United States	140,000

It is particularly unfortunate that the small limit of $20,000 is placed on aeroplane machinery this year, because experience shows that each aeroplane used for instruction requires two motors to carry on the work effectively. This of course will be impossible under the present limit, as the expense of repairs is also comparatively great.

It is requested that Congress remove these limits and thus permit the expenditure of as much as is necessary to continue progressive development and adaptation as rapidly as circumstances permit, with due regard for economy.

The plan is to restrict the shore establishment as far as possible, to place a few machines on shipboard at the earliest practicable date for test, and then to carry on the instruction in the fleet in a systematic way.

Naval aviators have demonstrated that hydro-aeroplanes can be readily flown at altitudes of 3,000 feet or more, where they are practically immune from rifle fire, and that the hydro-aeroplane is suitable for long flights. They have been the first to demonstrate that it is practicable to send aeroplanes in flight from ships, that it is possible to hoist them in and out like a ship's boat, and that it is possible to carry on instruction from a ship, using the water as an aerodrome. The work in progress indicates that they will soon be

able to leave the ship in flight without more trouble or preparation than is required to discharge a torpedo from an upper deck and to continue in flight with the machine automatically controlled and comparatively safe.

INSPECTION AND MATERIAL.

The aids for inspections and material have been frequently called upon for opinions upon matters regarding personnel and upkeep of naval vessels appearing in the reports of the various trials in inspections held by the Board of Inspection and Survey for Ships, the commanding officers of the fleet, and certain special inspecting boards, and on matters of policy in connection with the use or disuse of obsolete and obsolescent vessels of the Navy.

The Board of Inspection and Survey for Ships has been steadily occupied during the year, and the results of its work are manifest in its reports of 66 inspections of material held, and of 12 preliminary and 11 final trials of new vessels conducted. The work of this board is increased by the present practice of inspecting vessels of the fleet prior to their overhaul periods by a naturally impartial and highly specialized board of naval officers. These reports of material are comprehensive records of the condition of vessels and form a basis for the preparation of estimates for work incident to their overhaul.

PROGRESS OF WORK ON NEW VESSELS.

SHIPS LAUNCHED PRIOR TO BUT COMPLETED DURING THE PRESENT ADMINISTRATION.

Contract built:	Navy-yard built:
Michigan.	Patapsco.
South Carolina.	Patuxent.
Delaware.	Vestal.
North Dakota.	Prometheus.

SHIPS LAUNCHED AND COMPLETED DURING THE PRESENT ADMINISTRATION, INCLUDING THOSE EXPECTED TO BE FINISHED.

Contract built:	Contract built—Contd.	Contract built—Contd.
Utah.	Trippe.	C–3.
Arkansas.	Walke.	C–4.
Wyoming.	Ammen.	C–5.
Flusser.	Patterson.	D–1.
Reid.	Fanning.	D–2.
Smith.	Beale.	D–3.
Lamson.	Jouett.	F–1.
Preston.	Jenkins.	F–2.
Pauling.	Jarvis.	F–3.
Roe.	Henley.	E–1.
Drayton.	Neptune.	E–2.
Terry.	Orion.	F–4.
Perkins.	Mars.	H–1.
Sterrett.	Hector.	H–2.
McCall.	Vulcan.	H–3.
Burrows.	Cyclops.	G–1.
Warrington.	Sonoma.	G–4.
Mayrant.	Ontario.	Navy-yard built:
Monaghan.	C–2.	Florida.

SHIPS LAUNCHED DURING THIS ADMINISTRATION, BUT WILL NOT BE COMPLETED.

Contract built:
- Texas.
- G–2.
- Proteus.

Navy-yard built:
- Jupiter.
- New York.

(The latter launched Oct. 30, 1912, using the new launching trigger device.)

SHIPS AUTHORIZED, BUT WILL NOT BE COMPLETED DURING THIS ADMINISTRATION.

Contract built:
- Nevada.
- Oklahoma.
- Cassin.
- Cummings.
- Downes.
- Duncan.
- Aylwin.
- Parker.
- Benham.
- Balch.
- Sacramento.
- Nereus.
- Jason.

Contract built—Contd.
- Niagara.
- G–3.
- K–1.
- K–2.
- K–3.
- K–4.
- K–5.
- K–6.
- K–7.
- K–8.
- Pennsylvania.
- Destroyers Nos. 51 to 56.

Contract built—Contd.
- Destroyer tender No. 1.
- Eight submarine boats.
- Submarine tender No. 2.

Navy-yard built:
- Palos.
- Monocacy.
- Fleet oilers Nos. 1 and 2.

VESSELS CONTRACTED FOR DURING FISCAL YEAR 1912.

Battleships:
- Nevada.
- Oklahoma.

Torpedo-boat destroyers:
- Cassin.
- Cummings.
- Duncan.
- Downes.
- Aylwin.
- Parker.

Torpedo-boat destroyers—Continued.
- Benham.
- Balch.

Submarines:
- K–5.
- K–6.
- K–7.
- K–8.

Submarine tender:
- Niagara.

Colliers:
- Proteus.
- Nereus.
- Orion.
- Jason.

Seagoing tugs:
- Sonoma.
- Ontario.

Total tonnage of vessels contracted for, 146,210.

NOTE.—The contract for the construction of the gunboat *Sacramento* was awarded to the William Cramp & Sons Ship & Engine Building Co. August 16, 1912.

The awards for the construction of the river gunboat *Monocacy* and gunboat *No. 16*, appropriated for May 4, 1898, and now known as the *Palos*, were made to the navy yard, Mare Island, Cal., after open competition, on August 26, 1912.

VESSELS DELIVERED AND COMMISSIONED DURING FISCAL YEAR 1912.

Battleships:
- Utah.
- Florida.

Torpedo-boat destroyers:
- Mayrant.
- Walke.

Torpedo-boat destroyers—Continued.
- Patterson.
- Jouett.
- Jenkins.
- Fanning.

Submarines:
- E–1.
- E–2.
- F–1.
- F–2.

Collier:
- Neptune.

Total tonnage of vessels delivered, 69,120.

EIGHT-HOUR RESTRICTION.

In order to place contracts for battleships *No. 36* and *No. 37* as provided for in the naval appropriation act approved March 4, 1911, it was necessary to accept bids which materially modified the plans

and specifications as originally adopted by the department. The fact that no bids were received in strict accordance with the plans and specifications is undoubtedly due to the application of the eight-hour restriction to these ships.

In order to place the contract for colliers *No. 9* and *No. 10*, the appropriation for which included the application of the eight-hour restriction, it was necessary to accept certain modifications of the department's plans and specifications which were complied with in the contract for colliers *No. 11* and *No. 12*, which were let at the same time, but not under the provisions of the eight-hour restriction.

It has also been noted that in a certain bid received for miscellaneous minor craft the bid was made conditional on the nonapplication of the eight-hour restriction.

These circumstances indicate that the general application of the eight-hour restriction to all ship contracts will cause an increase in the appropriations necessary to obtain vessels of the same characteristics as formerly.

EXPERIMENTAL MODEL BASIN.

The very satisfactory results achieved upon the trials of new battleships and destroyers during the year were due largely to the investigations at the Experimental Model Basin. This establishment at the Washington Navy Yard has carried on for more than 10 years careful investigations of the most desirable forms and proportions for naval vessels with a resulting steady improvement in them. By reference to the large amount of data accumulated it is possible to determine at once the suitable form and proportions or the approximate horsepower required for any type of naval vessel, and the results obtained upon trials of the vessels that have been completed for several years past compare most favorably with those shown in other navies. Without the facilities of the Experimental Model Basin and its accumulation of data it would be impossible to predict with any approach to accuracy the speed to be expected upon trial of a vessel at all novel in type. The recent battleships and destroyers now in the fleet have each been the subject of careful and thorough investigation at the model basin during the preparation of designs, and because thereof every one of them has developed materially greater speed for a given power than could have been obtained otherwise.

The law authorizing the model basin provided that experiments might be made there for private shipbuilders, at their expense, and the department has taken pleasure in authorizing our progressive private shipbuilders and naval architects to make use of the facilities of this valuable establishment.

ELECTRICAL.

Specifications covering the electrical work on the battleships *Nevada* and *Oklahoma* and other craft authorized by recent legislation have been formulated. Plans for light, power, and interior communication for new battleships *Texas*, *New York*, *Oklahoma*, *Nevada*, for gunboats, for destroyers *43* to *50*, inclusive, have been prepared. Fixtures have been simplified and made cheaper and more durable.

The electrical control of searchlights has been redesigned and a new mechanical control has been developed. It is hoped that the improvements made will result in a perfectly satisfactory light for naval purposes.

GUN MOUNTS.

The triple-gun mount has been tested at the naval proving ground and, subject to minor modifications, is satisfactory. The manufacture of the four mounts for the *Oklahoma* and *Nevada* is well underway. This type of mount will be adopted for the four turrets of the one battleship appropriated for at the last session of Congress.

The 14-inch Mark I mounts for the *New York* and *Texas* are nearing completion, and the entire turret design for these vessels is a decided improvement on previous designs. The 14-inch Mark I mount will be installed in the two-gun turrets of the *Oklahoma* and *Nevada*.

POWDER.

Owing to the fact that the United States and France both use a nitrocellulose powder, the deplorable accident to the French battleship *Liberté* furnished a basis for criticism of the American powder and for assertions that similar disasters were to be anticipated in the United States Navy. While the two powders are of the same general type, both being nitrocellulose powders, they differ materially in the kind of solvent used, and French official reports show that their methods of manufacture, blending, and reworking are such as to cause the two powders to be radically different. Recent reports from France are to the effect that all powder now in service is to be withdrawn and replaced by powder exactly like that used in the United States Navy. The specifications under which smokeless powder is manufactured for the Army and Navy are very stringent in requiring absolute purity of all material used, exceeding care in every portion of its manufacture, and step-by-step inspection of the powder from the raw-material stage to the finished product. The regulations regarding stowage, care, and inspection of smokeless powder, both

on shore and aboard ship, are comprehensive and are very strictly observed. Since the adoption of the present type of smokeless powder by the Navy Department not one accident has occurred due to decomposition or spontaneous ignition of the powder—a record which is probably not paralleled in any other service.

POWDER FACTORY.

The output of this plant for the past year was about 1,500,000 pounds of new powder and about 970,000 pounds of reworked powder. The amount of new powder manufactured was about 50 per cent greater, and that of reworked powder about 28 per cent greater than for the preceding year. The production costs of new and of reworked powder have been reduced about 10 per cent in each case, owing partly to the increased output and partly to improvements in machinery and methods; this reduction was accomplished in spite of advances in price of sulphur, sodium nitrate, and cotton.

TORPEDOES.

Two new types of long-range, high-speed torpedoes have been built and have passed satisfactory test. A comparison of the characteristics of these torpedoes with those of the best in service abroad indicates that the United States is at least abreast of all foreign countries in this respect.

ORDNANCE MATERIAL FOR OTHER SERVICES.

During the year practically all vessels of the Revenue-Cutter Service have been equipped with 3-pounder or 6-pounder guns of latest types, the ordnance being loaned by the Navy Department to the Revenue-Cutter Service for this purpose.

EXPERIMENTAL FIRING.

In compliance with the wishes of the Committee on Naval Affairs, House of Representatives, exhaustive experiments with armor-piercing projectiles and with relatively thin-walled projectiles carrying a large charge of high explosive have been planned. Special target structures will be built on experimental target A (late the *Katahdin*), and it is expected that all preparations will have been completed by the 1st of December, so that the firing can take place shortly after that date.

NAVAL GUN FACTORY.

The increased volume of work done during the past year, combined with changes in administrative and shop methods and with improvement in facilities for work, has rendered the cost of work

less than during any preceding year. The subject of shop management has been given very careful attention with respect to possible application to the gun factory of the methods advocated by efficiency engineers. Certain features of the system have been introduced, and a real increase in efficiency has been secured without antagonizing labor and without introducing any features into the administration or work which are detrimental to the interests of the workmen.

FUEL.

The highest grade of steaming coal from the Pocahontas, New River, Georges Creek, and Eureka fields has been supplied the fleet at the lowest market prices. The department, through its arrangements with coal suppliers, is able to load at short notice about 40,000 tons per day at Hampton Roads and Baltimore.

The Navy still is in need of better fuel depots for the fleet at several important strategic points, notably Guantanamo, Puget Sound, and Pearl Harbor.

The capacities and facilities of these stations are being increased as far as practicable with the funds available.

The fuel stations at Frenchmans Bay, Me., and New London, Conn., have been closed.

Steps have been taken for the construction of fuel-oil tanks, as follows:

	Gallons.
Pearl Harbor, Hawaii:	
1 gasoline tank	90,000
1 fuel-oil tank	1,500,000
Guantanamo, Cuba, 5 fuel-oil tanks, each	1,500,000
Melville, R. I., 1 fuel-oil tank	700,000
Norfolk, Va., 1 fuel-oil tank	700,000
Charleston, S. C., 1 fuel-oil tank	700,000
Key West, Fla., 1 fuel-oil tank	700,000

SUBAQUEOUS TESTS.

Tests have been made to establish the relative efficiencies of coal stored for one year under water, under shed, and in the open at New London, Conn. There remains sufficient coal in these various storages to allow a continuation of annual tests extending over a period of 10 years, and it is proposed to carry out these tests, so that positive and definite conclusions may be drawn on a question which in the past has been a matter more of speculation and opinion than of conclusive experimentation.

RESERVATION OF COAL AND OIL LANDS FOR THE NAVY.

The department, in conjunction with the Department of the Interior, has taken steps to have set aside coal-bearing lands in the Matanuska and Bering River districts of Alaska. This coal is of excel-

lent quality, accessible, and can be transported by rail to the coast for shipment.

The increased use of oil fuel and the fact that coming battleships will burn oil exclusively has led to a need for this fuel. There is abundant oil in the Government lands of Alaska, California, and Oklahoma, and the department is negotiating for the transfer of some of these lands to the Navy, having secured one area in southern California by Executive order that, according to the estimates of geological experts, will produce 250,000,000 barrels of fuel oil. With the completion of the Panama Canal this oil can be transported to the Atlantic coast reservoirs at great saving to the Government over the present price of oil fuel. The addition of five oil-burning destroyers and increased use of oil by battleships fitted to use it has necessitated an increase in the annual contract, and additional tankage will be installed immediately at the present stations.

RADIOTELEGRAPHY.

Improvements in the radio equipment of the fleet and shore stations as regards increased range and prevention of interference during the past fiscal year have been made as rapidly as the appropriations permitted. The purchase of new radio apparatus conforming to the latest requirements is expensive, but the marked gain in efficiency makes such changes imperative.

The high-power station at Arlington, Va., is now in operation, and messages have been exchanged with Key West and Colon. It is the first of the proposed chain of high-powered radio stations, the others to be erected on the Isthmus of Panama, on the coast of California, in Hawaii, Guam, the Philippines, and Samoa. Valuable results as regards the control of the fleet at sea and widespread dissemination of time signals and storm warnings can be obtained when these stations are erected.

The Navy Department is maintaining 41 shore stations and 6 stations on light vessels. An expedition has recently been in Alaska modernizing and improving the older stations there and erecting a new station on the island of Unalga. The chain of Alaskan coast stations is, in conjunction with the inland Army stations, of great importance commercially, as an alternative means of communication in case of breakdown of the cable or land telegraph lines.

As Congress has enacted legislation regulating radiotelegraphy and making obligatory the opening of certain designated naval radio stations to paid commercial business, the radio work and expenses of the department will be largely increased. It will be necessary to modernize and improve the apparatus of coast stations so that the commercial work may be successfully handled. It is expected,

at the outset at least, that much of the burden of inspection for adjustment of commercial stations will fall upon this department. But the added work will undoubtedly prove an incentive to increased efficiency and will bring the naval stations into closer touch with commercial companies and their methods of operation, which, it is hoped, will mean a better appreciation of each other's work and cordial cooperation in regulation and the minimization of interference.

The high-powered radio station at Arlington, Va., consists of two 450-foot and one 600-foot self-supporting steel towers, a building containing radio apparatus, laboratories, storerooms, offices, living quarters for operating force, etc., and the necessary ground-wire system, water supply, roads, walks, etc.

Since the introduction of high-frequency quenched-gap radio apparatus the most urgent work of the department has been the modernizing of old installations. This work has been advanced during the past year as rapidly as limited funds and the slow deliveries of contractors have permitted. Much in this line remains to be accomplished, especially in the case of coastal stations, which, as a result of recent legislation, will be thrown open to commercial work. All new ships commissioned within the year have been provided with modern apparatus, but it has not been possible to properly equip the entire fleet because sufficient funds were not available.

With the assignment of two officers for the administration of this rapidly expanding branch it becomes possible, for the first time, to foresee a time when other and intrinsically more important features of this activity will be upon a satisfactory basis. These features relate to the development of radio for tactical purposes, experimentation in connection with purely naval needs, proper supervision and training of operators, and the standardization of material and operating methods.

HISTORIC SHIPS.

The custom of selling unserviceable vessels will before long dispose of the *Constellation*, *Portsmouth*, *Hartford*, and *Olympia*, unless their preservation be especially authorized. Some of these vessels could be preserved almost indefinitely with a small expenditure for occasional repairs, and their names would be a constant inspiration to the Navy and to the country at large to live up to their noble traditions.

RECEIVING SHIPS.

A new system has been inaugurated at the Philadelphia and Boston Navy Yards by which the receiving-ship business is carried on by a vessel in commission in reserve, but with the personnel and other business of the receiving ship so kept that the personnel may be

readily transferred and the vessel assigned to any other duty without delay. This system requires fewer officers and the cost of maintenance and repair of the old vessels, unserviceable for other purposes, is saved.

PROGRESS IN ACCOUNTING WORK.

In previous reports attention has been called to efforts to revise accounting and reporting methods and procedure. Recognizing that naval efficiency in no small measure depends on the efficiency with which the business side of the activities of the department are carried on, the introduction of more effective methods of obtaining prompt, accurate, and complete information was among the first problems to which attention was given.

In 1909 a fair beginning was made. In 1910 a firm of public accountants was employed to assist the technical corps of the Navy, at which time a complete system of cost accounting and reporting on work by jobs was established in those military yards that performed industrial work.

In 1911 arrangements were made to continue this work in cooperation with the President's Commission on Economy and Efficiency, and on July 1, 1912, a complete system of accounting for every branch and bureau of the service was devised and installation was begun. The purpose has been to supplement the job-cost accounting which had been installed in the military yards doing industrial work in such manner that the department will be able to have a complete, accurate, and prompt report on the business transactions of the whole department, with proper supporting details relating to each of its many activities—one which will enable the central administrative officer to have brought before him currently the facts necessary to exercise intelligent direction and control.

COST ACCOUNTING AT NAVY YARDS.

As the cost accounting established at Boston in July, 1909, and extended to the other military yards doing industrial work has developed, it has been found possible to extend the system in such a manner as to include in the indirect or overhead many charges which heretofore have been omitted. These charges, however, can not actually be made against appropriations and job orders, owing to existing statutes, but will be carried as a memorandum which will give most important data. The charges which it is proposed to thus include in the indirect expense in memorandum form until legislation is obtained are pay of clerical and drafting force and the charges for renewals and replacements when estimated to exceed the amount as laid down in the accounting instructions.

CERTAIN APPROPRIATIONS SHOULD BE AVAILABLE UNTIL EXPENDED.

Section 7 of the sundry civil act, approved August 24, 1912, provides that, with certain exceptions, appropriations made in any annual appropriation act shall not be available beyond one fiscal year, unless they are made so available in express terms. Certain appropriations for the Naval Establishment, such as public works, increase of the Navy, and special ordnance appropriations, which have heretofore been considered by this department and the accounting officers of the Treasury as available for obligation until expended, are, under the provisions of this section, available only for a single fiscal year.

Unless appropriations of this character are available until expended the department will be seriously embarrassed and the annual appropriations will be unduly swelled, as it will be necessary to have appropriations sufficiently large to meet the maximum progress on vessels and other large projects under construction. Then, if progress is less rapid than anticipated, large balances would be turned back into the Treasury only to be reappropriated in subsequent years.

Work of the class covered by these appropriations—new vessels, dry docks, special ordnance work, etc.—as a rule requires two and one-half years or longer for completion.

The amounts involved are as large as those in the five classes of appropriations which are available for expenditure until exhausted or completion of the project, viz, "Rivers and harbors," "Lighthouses." "Fortifications," "Public buildings," and "Pay of the Navy and Marine Corps."

In connection with work of this magnitude considerable time is necessarily required for the preparation of plans and specifications and the making of contracts, and in such cases actual work may not be started until near the close of a fiscal year. Where the work is performed by contract the actual performance of the work may extend beyond the fiscal year. However, certain classes of work and work in certain localities can not be economically constructed by contract, but should unquestionably, in the best interests of the Government, be constructed by yard labor. At times, as in the case of certain new vessels, the work is required by law to be performed at a navy yard.

The department therefore earnestly recommends that appropriations of this character be restored to their former status of permanent or continuing appropriations.

GENERAL STOREKEEPING SYSTEM.

By having large purchases of articles ordinarily used assigned to different yards as distributing points uniformity in the articles used

by different vessels has been secured and a considerable reduction in cost has been effected.

The manufacture of certain articles has been concentrated at those yards where it has been demonstrated that the work can be done most economically.

Efforts have been made to diminish excess and inactive stock by having general storekeepers at the various yards forward to other yards lists of material for which there has been little or no call for an extended period.

EMPLOYMENT OF EXPERT ON SCRAP METALS.

During the past year the department has employed the services of an expert in all matters pertaining to the handling and classification of scrap metals and miscellaneous material usually condemned for sale at the various navy yards. This expert has been engaged at the yards in educating Government employees as to the proper classification of scrap metals and in devising means by which material heretofore wasted could be saved to the Government.

NAVY YARDS AND STATIONS.

ADMINISTRATION OF THE YARDS.

The present subdivision of work in the navy yards into a hull division and a machinery division has been eminently satisfactory. It has placed under one division all work pertaining to the structure of the ship and under the other all pertaining to her machinery, of whatever nature. Each division is under the direct supervision of an officer specially skilled in the work he controls, and the organization is such that efficient cooperation exists between the two divisions. The practical result is shown in the promptness with which repairs are undertaken and completed. the efficient manner in which work is done, and the economy that has been effected.

A closer departmental control of the administration of the navy yards and a more systematic advance in consolidation and coordination have resulted during the past year through the operation of the office of director of navy yards.

INSPECTIONS AT YARDS.

The Board of Inspection for Shore Stations has materially assisted in the economy of the present administration by its scrutiny of the estimates of navy yards and its broad, impartial view of the expenditures proposed therein. This board has been, and is now, engaged in a comprehensive compilation of navy-yard data which will afford a valuable means for comparison among the different yards. The

board is also engaged in the preparation of the outlines of organization of the naval establishment to the final units of the service as of date July 1, 1912. These outlines have been called for by the President in connection with the Commission on Economy and Efficiency.

As the navy yards are primarily military adjuncts of the fleet, it is of exceeding importance to national safety that the Department should have definite knowledge as to their existing capacity and efficiency. The supervision essential to such knowledge can best be effected by extending the work of the Board of Inspection for Shore Stations to efficient and periodic inspection of such stations.

FUTURE OF NAVY YARDS.

It is essential to naval progress and efficiency that the development of the several navy yards should be concomitant with necessary augmentation of the fleet, and such efficiency can only be brought about through some central agency, which will carefully investigate the military usefulness of each yard, both in relation to its strategical, commercial, and manufacturing advantages, as well as in regard to its adaptability and capacity for contributing to the endurance and efficiency of the fleet. The Joint Army and Navy Board reported that the ideal plan for the Navy would be to have two great naval bases on the Atlantic coast in harbors which would receive and could maintain the entire fleet and its auxiliaries.

As a result of the policy of spasmodically developing various navy yards, independent of their particular adaptability for contributing to the efficiency of the fleet, there has undoubtedly been incurred heavy and needless expenditure in the past, but the present policy is that the military value and usefulness of all navy yards is best subserved by limiting their extension along such particular lines as will promote such efficiency.

It may be noted here, in connection with the matter of giving up navy yards, that, after the opening of the canal, when the fleet will spend part of its time in the Pacific Ocean, the services of the eastern yards will be much less in demand than they have been heretofore. Should it be deemed wise in the future for the fleet to spend half of each year on the Pacific coast, some of the navy yards on the eastern coast will automatically close from lack of work.

COORDINATION.

In the administration of the navy yards the prime requisite is to secure that spirit of coordination which alone permits of economical management and produces excellent results. The influence of the work and methods obtained through bringing the offices together, as was done at Norfolk, Mare Island, and Puget Sound, has also

spread to those yards where central offices are still lacking, so that all along the line the efforts to work together are most gratifying.

Besides the work of inaugurating a uniform system of modern management at navy yards, much work of a miscellaneous character has been accomplished through the office of director of navy yards, in its "clearing house" capacity for navy-yard matters requiring speedy action and centralized consideration. Adjustment of pay of workmen, reducing the great number of trade ratings, and bringing about a closer approximation of similar pay for similar duties in supervisory and classified force have been and still are being pressed to a bettering of conditions. Threatened strikes have been dissipated and labor questions satisfactorily settled without serious trouble. "Class" designation of workmen has been abolished.

A uniform system of "shop stores" has been formulated and put into operation, the apprentice school system at navy yards has been extended, and the consolidation of shops has been continued.

A set of rules upon which can be operated all navy yard skilled labor under civil-service classification has been drafted by a special board in conjunction with the Civil Service Commission.

The subject of protection of yard workmen from accident has been thoroughly investigated, and illustrated lectures by the director of the American museum of safety have been given at many of the yards upon the design and application of the most modern appliances for safeguarding men working with or near moving mechanism. Instructions have been issued to all yards, bringing about a monthly inspection of all shops expressly to maintain proper safety devices at all points showing necessity therefor.

SHOP MANAGEMENT.

In the matter of improving and unifying the system of shop management at the yards, progress has been made with a view to securing results of permanent value. To the main characteristics of the Vicker's system have been added other features necessary to fit it to the work of general repairs and to accommodate the requirements for relegating costs of work to the several appropriations and bureaus. The details for operating the system have been finally worked out at Norfolk and have been published to the other yards for adoption.

To properly install this system of shop management requires a central administration office at each yard so as to bring together the officers and the clerical and drafting force within one building or in contiguous buildings. There is included in the estimate for 1913–14 a minimum amount of money required to bring about this most important consolidation at those yards still unprovided for, and it is earnestly requested that Congress appropriate the money asked for and that the funds be made immediately available in order not to delay the necessary construction.

OVERHAUL PERIODS.

Too much importance can not be attached to the recognition of and adherence to the existing system of home-yard assignments and scheduled overhaul periods. Efforts have been directed toward the maintenance of a steady flow of work at navy yards, and consequent retention of a class of efficient and capable employees.

Ships that have undergone extensive repairs and overhaul at various navy yards during the fiscal year 1912 and returned to active service or reserve.

Portsmouth, N. H.	Boston.	New York.	Philadelphia.	Norfolk.	Mare Island.	Puget Sound.
Tennessee. Montana. Wisconsin.	New Jersey. Rhode Island. Georgia. Nebraska. Birmingham. Nashville. Chester.	North Dakota. Connecticut. New Hampshire. Delaware. Salem. Tacoma. Dixie. Machias.	Idaho. Minnesota. Connecticut. Montgomery. Maine. Missouri. Mississippi.	San Francisco. Louisiana. Kansas. Vermont.	California. Maryland. Cincinnati. Raleigh. South Dakota. Alert. Annapolis. Vicksburg.	Pennsylvania. Cheyenne. Colorado. St. Louis.

The beginning of the fiscal year 1912 was marked by the completion of the extended overhaul of the *Maine*, *Missouri*, *Ohio*, and *New Jersey* and the addition of these four vessels to the Atlantic Fleet, thus beginning the 21 battleship fleet.

There remained, however, on July 1, 1911, at the various navy yards a considerable number of vessels "in ordinary," undergoing repairs and unavailable for service. In particular there were the *Wisconsin*, *Kearsarge*, *Kentucky*, and *Alabama*, three cruisers of the *St. Louis* class and four cruisers of the *Denver* class, together with several minor vessels.

Systematic efforts were made to complete this work, and in the early spring of 1912 practically everything undertaken had been accomplished. On March 15, 1912, 100 per cent of our battleships were for the first time in recent years materially ready for service. A shortage of personnel and a due regard for the possible demands of the active Navy for funds prevented the commissioning of the *Kentucky*, *Kearsarge*, *Illinois*, and *Alabama* and the *Denver* class until just before the beginning of the new fiscal year. The *Wisconsin* being in second reserve was commissioned and placed in the reserve fleet at Philadelphia during the spring.

Attention is invited to the fact that as the result of mutual arrangement and agreement between this department and other coordinate branches of the Government the facilities of our navy yards and stations have been placed at the disposition of the War Department, Treasury Department, and the Department of Commerce and Labor, and that a considerable amount of work, at prices that have compared favorably with outside firms, has been accomplished on the vessels belonging to the above departments.

GUANTANAMO.

A comprehensive scheme for the naval station at Guantanamo has been worked out and approved by the department. Emergency repairs can be made with the plant appropriated for, although the repairs will be limited to those that can be made on a ship not in dock. An ample fresh-water supply is being provided for as well as an adequate supply of fuel for the fleet.

Construction work has been actively prosecuted during the past year, and at the present time there have been completed the station wharf, the fuel-oil wharf, foundations for several of the oil tanks, and 60 per cent of the filling in of the site; steel work for all the shop buildings has been delivered and the erection is progressing rapidly. These buildings will be ready for the installation of equipment in January, 1913. A large part of the power-plant equipment is on the ground, and the foundations for the machinery are being placed. The plant should be completed sufficiently to furnish power by the end of the present fiscal year. Two fuel-oil tanks, water tank, and one gasoline tank have been shipped, and the pipe line from the oil tanks to the wharf is now being laid. The remaining fuel-oil tanks have been contracted for. All the materials for construction work at the magazines are being assembled.

The two 250-foot self-supporting steel towers for wireless station are under advertisement and will be erected during the coming spring. Investigations are being made of the possible sources of a permanent water supply. Borings have also been taken and test piles driven on the site of a possible dry dock. The location of this station with respect to material and labor markets has made it extremely difficult to carry on construction work with rapidity. Every effort is being made, however, to secure its completion by the end of the present fiscal year.

PEARL HARBOR.

At Pearl Harbor the dock and repair plant now being constructed will permit repairs to be made of any character on the largest ship that can pass through the locks of the Panama Canal.

The building up of this naval station has gone steadily forward. The dredging of the 35-foot channel from the sea to the naval station, a distance of over 4 miles, was practically completed December 16, 1911, on which date the U. S. S. *California* entered the harbor and anchored off the naval-station site.

The construction of shop buildings, administration building, power-plant building and machinery, storehouse, marine barracks, quarters, streets, sewers, and miscellaneous improvements is under way and will be completed during the coming winter. Special attention is being given to the development of this station, as its importance

will be greatly enhanced on the completion of the Panama Canal, and everything possible is being done to prepare it for active work at the earliest practicable date.

PANAMA CANAL.

The Navy Department has forwarded to the War Department the Navy's needs with regard to the fueling, docking, and repairing facilities at the terminals of the Panama Canal, and most of these will be incorporated in the general scheme for the completion of the terminals. These include extensive docking and repairing facilities at the Balboa terminal, and coal, oil fuel, and lighterage facilities at both terminals. While this scheme does not fulfill all of the conditions laid down by the General Board, it is capable of future expansion in that direction. As now designed it will furnish at least a good emergency repair station, with ample fueling facilities. Future development of the plant should take into consideration the needs of the fleet in time of war and any enlargement contemplated should be passed upon by the Navy Department.

If the Panama Canal Commission will build their colliers for transporting coal, after designs which the Navy will furnish, it will be a splendid piece of business economy and show wise judgment on the part of our Government, because they will serve two purposes—the Panama Canal Commission in time of peace and a reserve for the Navy for war purposes. The high-power radio station in the Canal Zone will be erected and operated by the Navy for communication with Washington and with the stations at San Juan, Key West, and Guantanamo. It may be interesting to note that the opening of the Panama Canal may have an appreciable effect on the price of oil fuel, as it makes the California oil fields available for supplying the Navy.

CLOSING OF NAVY YARDS AND COALING STATIONS.

In pursuance of the department's policy of dispensing with such navy yards and stations as are not necessary to the upkeep of the fleet, the naval stations at Pensacola, New Orleans, San Juan, Culebra, and Sitka have been closed. The coaling plants at Frenchmans Bay, Me., and New London, Conn., have also been shut down with a view to their ultimate abandonment and disposal of the land. Several hundred tons of coal remain at each of these coal plants; this will be removed as soon as opportunity permits. The old Spanish floating dock at Pensacola had deteriorated through age to such an extent as to be rendered no longer useful for naval purposes. It was therefore sold.

The floating dock at New Orleans is in condition to dock vessels up to 16,000 tons displacement. At present its use is confined to

docking merchant vessels and a few small Government craft. It is recommended that legislation be enacted to permit the Secretary of the Navy to transfer this dock to such locality as occasion may require.

The site of the naval station at San Juan, Porto Rico, has been turned over to other departments for uses of the Lighthouse, Weather Bureau, and insular Government.

DOCKING FACILITIES.

In 1900 battleships of about 15,000 tons had been authorized and the Government had completed or under construction six graving docks and two floating docks in which the largest ship could be docked. In 1902, 1903, 1904, and 1905 Congress authorized the construction of battleships of 16,000 tons, which were still within the capacity of the larger dry docks, there being an increase of but 1,000 tons in six years.

In 1906 and 1907, however, authority was given for the construction of battleships of 20,000 tons, followed by 22,000 tons in 1908 and the *Wyoming* and *Arkansas* of 26,000 tons in 1909. When the construction of the last two ships was commenced the Government had no dry dock built or building of sufficient size to receive them, so rapid had been the increase; that is, from 16,000 tons to 26,000 tons, or 62½ per cent in the size of ships in the four years ending with 1909.

There were then, however, under construction three large dry docks at New York, Puget Sound, and Pearl Harbor, respectively.

NEW YORK DOCK.

The work on Dry Dock No. 4 at New York had been under way since 1905 under two successive contracts. The original contract for this dock provided for a length of but 523 feet 6 inches and a width of 93 feet. The length was increased to 592 feet 6 inches in 1908. Great difficulty had been met on account of the nature of the soil, which tended to flow into the excavation. On October 2, 1909, the second contract was annulled for lack of progress, and it was decided to adopt a new procedure and to limit the request for proposals for the completion of the dock to five well-known contracting firms of financial strength and large experience in works of similar nature and magnitude. Satisfactory proposals were received and a contract was entered into during this administration (November, 1909) which permitted the work to be carried on pending action by Congress on the recommendation for an increase in the size and cost of this dry dock to make it available for ships of the *Wyoming* class and larger. The final contract was made during this administration (September 1, 1910), providing for a dry dock with a length of 694 feet 6 inches from coping at head to caisson when in outer gate seat, a width at

elevation of top of keel blocks of 112 feet, and a depth over the sill at mean high water of 35 feet. At the same time a radical change was made in the design providing for reenforced concrete carried on pneumatic caisson piers, a construction similar to that employed in the foundations for high buildings but novel in dry-dock design. Under the last contract the work was pushed, and the dock has been completed and officially accepted. It will dock the largest battleship yet contemplated.

PUGET SOUND DOCK.

A contract was made on September 2, 1908, for the largest dry dock which had yet been authorized, to be constructed at Puget Sound. This dry dock was to have a length of 827 feet 6 inches and a width of about 100 feet. In order to provide for ships of the beam of the *Wyoming* and larger, a board was appointed during this administration (April, 1910) to determine the change in contract price involved by widening this dock so as to give a width of 110 feet at the keel blocks, which corresponds to that of the locks of the Panama Canal. In the meantime Congress had been urged to provide the additional funds required for this increase in width, and the act of June 24, 1910, raised the limit of cost to $2,300,000, and a supplemental agreement was promptly entered into for widening the dock. The site for this dry dock was unusually favorable and the work has progressed smoothly. The dock is now essentially completed, with the exception of the removal of the temporary cofferdam across the entrance and a small amount of dredging. It is expected that the dry dock will be ready for service about January 1, 1913.

PEARL HARBOR DOCK.

The original appropriation for the dry dock at Pearl Harbor was $2,000,000, and an attempt was made to obtain a dock 1,000 feet long between head and outer gate seat with an intermediate caisson dividing the dock into two sections for use in docking smaller vessels. Plans and specifications were prepared on this basis and bids were opened on February 13, 1909. All proposals were much in excess of the appropriation and the Secretary recommended that the limit of cost be raised to $3,500,000. This increase was not authorized, and although the need of a dock of the maximum length was fully appreciated it was not considered expedient to delay all construction until the necessary increase in cost had been authorized by Congress, so that on May 22, 1909, bids were again opened for a dock with a length of 591 feet 6 inches. Satisfactory proposals were received and the contract was awarded. A dock of this size would not take the ships of the *Wyoming* class, and authority was obtained during this administration to increase both the length and the width, the former to

791 feet 6 inches and the latter to 110 feet. The appropriation act of August 22, 1912, authorized a further increase in usable length to 1,000 feet. The cost of this change has been determined by a board and supplemental agreement is about to be entered into with the contractor. This dock will be the largest dock so far authorized by the United States. Serious difficulties have been met, owing to the nature of the material underlying the site, but it is believed that they have been overcome and that the work will now be pushed to completion without serious delays or further complications.

NORFOLK DOCK.

Dry Dock No. 3 at Norfolk, which had recently been completed, was of satisfactory width, 98 feet at keel blocks and 136 feet at coping, but too short to receive the new ships. An appropriation for tearing out the old head and building a new head section to give a length of 723 feet was made during this administration (June 24, 1910). Plans and specifications had already been prepared and the contract for lengthening the dock was made on August 6, providing that the work should be completed within 15 months and that the dock should be out of service but 4 months. The work was completed on this schedule and the dock will now receive the largest battleship authorized or contemplated.

BOSTON DOCK.

Dry Dock No. 2 at Boston had been completed in 1905 with a length of 738 feet, but the cross section of body of the dock had been made to conform to the typical battleship cross section of that day. Later practice in battleship construction has tended toward a more nearly rectangular midship section for battleships, and it was found that by cutting back the altars near the bottom of the dock its usefulness would be much increased. The sum of $15,000 for this work was appropriated during this administration (Mar. 4, 1911) and made immediately available. Plans had been previously prepared and work was started and completed by yard force. As originally constructed the dock would safely receive vessels of the *Delaware* class, 20,000 tons; the dock will now receive ships of the *Utah* class of 21,825 tons.

MARE ISLAND DOCK.

Dry Dock No. 2 at Mare Island was commenced in 1899, but great construction difficulties were encountered, and the contract was twice annulled. The dock was finally satisfactorily completed and accepted on May 14, 1910, and will receive battleships of the *North Dakota* class 20,000 tons.

It will be seen that upon completion of dry docks now under construction the Government will possess at Pearl Harbor a dry dock which will receive any ship which can pass through the Panama

Canal, and at Puget Sound and New York docks which will be wide enough to take any ship which can pass through the canal, but limited in length to 800 and 680 feet, respectively, allowing reasonable clearances for docking and undocking. These three docks, with one at Norfolk, are the only ones which will receive the *Wyoming*, *Arkansas*, *New York*, *Texas*, *Nevada*, *Oklahoma*, and *Pennsylvania*. It will be further noted that there are but two of these dry docks on the Atlantic coast, one on the Pacific coast, and one in the Hawaiian Islands, so that should one of the large battleships receive injuries which would require it to remain in dry dock for a considerable period, or should the dock itself be placed temporarily or permanently out of service, a dangerous condition might result.

FLOATING DOCK.

The construction of a floating dock of about 40,000 tons capacity is recommended.

GRAVING DOCKS.

With a view to the natural increase in size of vessels, a 1,000-foot dock for the Atlantic and one for the Pacific coast is recommended, the locations to be determined later.

FORTY-FOOT CHANNELS.

The department approves the recommendation of the General Board that channels leading to all the first-class docking, repair, and supply yards be dredged to a depth of 40 feet at mean low water and to a least width of 750 feet and greater if practicable. Action in this respect is necessary to insure safe passage for war vessels of increasing draft.

PERSONNEL.

HEALTH CONDITIONS OF THE NAVY.

The general health of the Navy from January 1 to December 31, 1911, has been good and shows a slight improvement over that for the previous year and a marked improvement when compared with that for the "average year." The reduction in damage rate from injuries has been more marked than that from diseases, both for the previous year and for the "average year." The death rate from all conditions shows a marked reduction, both from that of the previous year and of the "average year." Among the natives of Guam the births have exceeded the deaths, while in Samoa the reverse has been true. From January 1, 1912, to June 30, 1912, 26 of the naval personnel were admitted to hospitals other than naval hospitals, 10 to hospitals beyond the continental limits of the United States, and 16 to hospitals within these limits. Further, there have been 2,493 supernumeraries treated by the service during the calendar year 1911,

with a total of 43,112 sick days, many of whom were officers and men of the navies of foreign powers.

Campaigns against tuberculosis, typhoid, insect-borne diseases, and lead poisoning have been instituted. Typhoid prophylaxis has been administered to practically the entire navy personnel without a single serious result, and no authentic case of typhoid fever has been reported in an individual who had received the three injections required.

The adaptability of incinerators for garbage and waste to ship use and the advantages accruing therefrom have been amply demonstrated by their trial on vessels of the battle fleet.

The method of heating and ventilating ships by the combined system is a good one in principle, but as at present installed on certain vessels has not met with success. The defects that have become evident through practical application can, it is believed, be rectified.

There has been a marked improvement in the conditions surrounding the barber shops, both afloat and ashore.

An investigation of the air in submarines has been inaugurated, and it is apparent already that it will be of great value to the service.

PHYSICAL TRAINING.

Attention has been given to developing a proper system of physical training that may be uniform throughout all branches of the Navy to replace the existing physical drill, which does not inculcate habits of care, strength, and activity to the degree attained by the more scientific method, which has already been introduced at the Naval Academy with marked success. A special feature has been made of swimming, all midshipmen being required to qualify thoroughly before receiving their diplomas; and a higher standard being established for the swimming qualification in the fleet for both officers and men.

The officers' physical test has been changed to a 10-mile walk monthly, which has removed any irksomeness, while increasing the benefit derived.

FLAG OFFICERS.

The necessity for admirals and vice admirals for a properly administered fleet should receive immediate attention from Congress. No provision is now made for any except the lowest grade in flag rank, that of rear admiral. The recognized grades, in order, are admiral of the fleet, admiral, vice admiral, rear admiral. A battle fleet should be commanded by an admiral; vice admirals should command squadrons; rear admirals should command divisions. Our great battle fleet is commanded by a rear admiral, with four other rear admirals under his orders. This violates the principle of rank, which is that

each separate degree of duty and authority, all depending one on the other, requires a separate rank.

It is not a question of our naval officers, as individuals, being placed in inferior positions when they meet the fleets of other nations. It is that in the eyes of other nations we put ourselves in the position of an inferior.

History has shown that a proper organization of an army or a navy requires various grades.

The fleets are much larger to-day, with divisions and subdivisions, and there is needed, for proper organization, admirals, vice admirals, and rear admirals, just as other nations have them. Nineteen nations have ranking naval officers above that of rear admiral.

We have more vessels in commission than most of the nations giving higher rank to their officers; yet when our fleets enter foreign waters our naval officers are compelled to yield precedence to ranking officers of smaller nations. This is not an indignity to the man so much as to the United States.

The fact that the grades of admiral and vice admiral do not exist in our Navy is inconsistent with the size of our fleet and with the dignity of this country. When it is realized that *nineteen of the navies of the world include at least vice admirals—nine of them admirals—and Japan, Germany, and England admirals of the fleet in addition*, it is felt that this matter should be corrected in our service by appropriate legislation.

The following list of the flag officers of all nations, shows that in any combined operations or international functions where naval forces are present *the United States would take the lowest place in rank.*

Country.	Admiral of fleet.	Admiral.	Vice admiral.	Rear admiral.
England	3	12	22	55
Germany	2	4	13	21
France	----------	----------	15	30
Italy	----------	1	8	18
Austria	----------	2	2	10
Spain	----------	[1] 1	3	9
Russia	----------	8	18	28
Japan	1	7	17	45
Holland	----------	(*)	3	2
Denmark	----------	----------	1	3
Norway	----------	----------	1	1
Sweden	----------	----------	2	2
Argentina	----------	1	2	7
Brazil	----------	[2] 2	[2] 2	[2] 10
Chile	----------	----------	[2] 2	7
Peru	----------	----------	(3)	(3)
China	----------	----------	1	[2] 4
Portugal	----------	----------	2	5
Turkey	----------	----------	4	8

[1] Grade exists, but is now vacant.
[2] One acting.
[3] Yes; number doubtful.
[4] Lieutenant admiral; exists, but is now vacant.

It is recommended that a bill providing for increased flag rank, and similar to the provision contained in the last naval appropriation bill as reported to the House, be reported early in the session and separate from the appropriation bill.

QUALIFICATIONS OF OFFICERS.

During the last few years special study has been made of reports required to be rendered periodically on officers. The requirements have been thoroughly revised and so stated and arranged on the new forms for making the reports that the data may be readily classified. By this means the assignment of duty according to qualifications and experience and the more even distribution of duty on the various stations should be accomplished with facility and certainty. These records will in time give a complete history of the qualifications of every officer from date of admission in the service.

We want our flag officers to be strong, alert, active men; men of the highest professional attainments and able to endure the physical and mental strain of dangerous and protracted operations during hostilities. To reach this standard means excellence in all the junior grades.

ASSIGNMENT OF FLAG OFFICERS AND CAPTAINS.

Until recently there has been no system actually worked out in detail showing the officers who will probably be selected for important duty in the future. Now that a system is in operation it should be corrected monthly, as it is impossible, on account of casualties, retirements, etc., to hold absolutely to any detailed sheets of assignments for a considerable period of time.

It is only by some such definite and written arrangement that the best interests of the service are served. Haphazard appointments are prevented, and as a general rule the best man for any particular important command is chosen long beforehand, and his duty as a captain is arranged with special reference to his training for the assignments he will have as a flag officer.

In the hands of the aids—men of large experience and of mature judgment—has been placed the responsibility of recommending to the Secretary the assignments to important duty of officers in the grades of captain and rear admiral.

In the preparation of the assignment sheet certain definite conclusions were reached, and it was found that the system could be in full operation in a year or two.

It is evident that no officer should be retained at sea up to the date of his retirement. In order that the information that he has gained may become of use to the Navy at large he should, after being in command of one of the large fleets, be ordered to a station, such as the General Board, where he can properly present the im-

portant mass of information he has gained during his service. This reason alone would require that he be ordered ashore some six to eight months before his date of retirement. But the ideal condition for the best interests of the service would be to choose as commanders in chief, when other qualifications are equal, men who have considerable time to serve as flag officers.

Their duty should be so arranged that they hoist their flags at sea as division commanders as soon as they have reached the grade of rear admiral, and that after a period of about a year on this duty they should, if recommended for commander-in-chief of a fleet, hold the latter post for from a year and a half to two years. In reviewing the list of officers and taking into consideration the time they will have to serve in flag rank, it is found that this general scheme can be admirably worked out and that officers who are selected for commanders-in-chief will, on the completion of that duty, have still several years more to serve, and can then be assigned to the important billets on shore.

By limiting the time of division commanders to from 12 to 16 months there is made available a great number of flag officers who have actually been in command of divisions in the fleet and who can be called upon as experienced flag officers at any time should hostilities threaten.

By the above general arrangement it is seen that in case of hostilities the country would always have at least 12 officers to choose from for the chief commands afloat—officers who have had experience as division commanders and commanders-in-chief of the fleets, and who would have some time yet to serve.

It would appear that officers having considerably less than three years to serve in flag rank should not be assigned as flag officers in the active fleet, for they would not be available for duty as commanders-in-chief, nor would they have a number of years after completion of sea duty to discharge important duties on shore and be available in case of hostilities.

Since there are only a certain number of available flag commands afloat, officers nearing the retiring age, if serving as division commanders in the active fleet, would be taking the duty which should, *for the best interests of the service*, be properly assigned to officers who have longer to serve.

It will be seen that the duration of time in the captain's grade is from four to nine years. It should be stated, as a general rule, that captains should be sent to command large ships as soon as they have been promoted, and that such of them as are intended for future positions in the fleet as flag officers should have two years in command of one of the battleships in the active fleet (for officers whose time in the captain's grade is but four years). Officers who remain

in the captain's grade for a period long enough to give them two commands at sea should go first to the older ships for two years, and the most modern ships should be given as second commands to those who have made a success during their first service afloat as captains.

In the assignment of officers to important duty in navy yards, special attention has been paid to making the tour of duty from three to four years.

PROPOSED PERSONNEL BILL.

The passage of a personnel bill, including the amalgamation of the various corps, as shown in the proposed bill, is strongly urged. This bill has now been brought up to date to conform to the new personnel measures passed last session. It has been considerably simplified and shortened, because the graduate midshipmen are now commissioned ensigns.

It is the department's desire to have this bill become a law in its entirety, as piecemeal legislation on such an important subject tends to defeat the object in view.

The proposed bill is the scientific and logical disposition of the pressing personnel question and is the result of long and careful study of the entire matter.

Its cardinal feature bases the personnel on the battleship and cruiser tonnage of the Navy and allows the department to estimate the numbers needed each year, the estimate in no case to exceed the full strength as determined by the tonnage, and leaves to Congress the actual numbers to be allowed.

Connected closely with these numbers is the proposed rearrangement of the grades and the time necessary to serve in each.

These three features are vital to the service and, coupled with elimination, will insure a proper training in each grade, as well as furnish young officers for flag rank with sufficient time in the highest grades to thoroughly master the tremendous responsibilities which attend the command of a modern fleet.

This question has been studied from all points of view, both foreign and our own, and the proposed bill affords a safe and sane solution of a subject which every nation possessing a navy must face.

In addition to producing efficiency, the bill will not increase the comparative cost of the Navy. Owing to retirements at graded rates of pay there will be in the future a saving in the total sum appropriated for the Navy personnel.

The present organization of the personnel is not economical. The proposed bill will make it so, and at the same time greatly improve the efficiency of the service.

At the end of this fiscal year the law relating to the increased numbers of midshipmen at Naval Academy comes to an end. Sections 7, 8, and 9 of the bill take cognizance of this matter and should become law whether the bill passes or not.

THE NAVAL WAR COLLEGE.

An 18 months' course of instruction was instituted at the United States Naval War College, Newport, R. I., on June 1, 1911, and has been in effect 16 months. The course during the four summer months of 1911 was identical with the short, or summer, course, but in the summer of 1912 the long-course officers took up an advanced line of work distinct from that of the newcomers.

Naval War College work is professional training, dealing with military employment, and is chiefly concerned with the question of leadership—promoting the military efficiency of the individual rather than that of his command. The subjects of study are international law, national and military policies, strategy, tactics, and logistics, but administration and organization are included as a foundation upon which all strategy and tactics must rest. The international-law situations are brought before the annual summer conference and the solutions are published by the department. These are eagerly sought by public libraries and students of international law, have a high reputation abroad, and have had a marked effect in modifying recent development of international law.

OUTPUT OF NAVAL ACADEMY.

This year 265 midshipmen entered the Naval Academy; next year there may be as many, or even more, on account of the reapportionment of congressional districts. After June 30 next, however, the law provides that Senators, Representatives, and Delegates shall have only one appointment instead of two. This law, passed in 1903, contemplated that the increase of officers then provided for would be sufficient to meet the Navy's requirements by 1913. This expectation has not been realized, and the shortage of officers, though less than before, still makes a serious limitation on efficiency and curtails work of wide usefulness.

The present capacity of the Naval Academy is sufficient to furnish officers for the line and staff of Navy and Marine Corps in adequate numbers for many years to come; but if the number of midshipmen be cut in half, the relative cost of educating them will increase, while the existing shortage in the Navy will grow rapidly worse. There is little likelihood of more graduates from the Naval Academy than the Government will require, even if the school be kept up to its

full capacity of 945 in all four classes; but if there should be a surplus, they would still be available as a reserve in civil life. Such a reserve was of great value in the War with Spain. On the other hand, if too few are graduated, no relief of the resulting shortage in the service can be realized for four years. It was a situation of this kind that seriously embarrassed naval administration during the years directly following the Spanish War.

A continuation of the present number of appointments is therefore necessary, and a provision to this effect is incorporated in the draft of the naval personnel bill hereinbefore mentioned.

NAVAL ACADEMY CURRICULUM.

The abolition by act of Congress of the two years' cruise for graduate midshipmen before being commissioned as ensigns, and the development of postgraduate courses for officers in several special branches, have led to a revision of the Naval Academy curriculum, with the general aim to make the institution more thorough in the elements indispensable to the general training of all naval officers, thus at the same time laying the foundation for further study in the more abstruse and special subjects by postgraduate courses for those who demonstrate aptitude for them.

The changes will go into effect in the main with the opening of the academic term in October. One marked feature is the establishing of Spanish as the foreign language of paramount importance in the course in modern languages, with French next. The new form of practice cruise necessitated is already in effect, first and second class midshipmen being distributed among the battleships of the Atlantic Fleet for the summer months, to their great advantage in acquiring familiarity with the duties of general naval service.

SCHOOL OF MARINE ENGINEERING.

The School of Marine Engineering has completed with marked success the third year of its existence. The interest held by the service in this school and the desire of young officers to perfect themselves in engineering are evinced by the large number of applications for instruction at that school. In addition to the regular course, lectures were delivered on various technical subjects by Mr. L. W. Spring, Prof. Henry Fay, Mr. Sidney A. Reeve, Mr. W. R. Hulbert, Mr. G. C. Davison, Prof. Ira N. Hollis, Mr. J. G. Callan, Mr. Henry G. Chatain, Mr. J. H. Nicholson, Dr. Rudolph Diesel, Dr. Wm. H. Tolman, Mr. Maxwell W. Day, and Dr. D. S. Jacobus. The course during the next year will be considerably extended. During the summer months the classes are on duty under instruction at the largest inspection districts and at the New York Navy Yard.

CIVIL EMPLOYMENT OF OFFICERS.

The naval appropriation act approved June 10, 1896, contained the following provision (29 Stat., 361):

* * * That hereafter no payment shall be made from appropriations made by Congress to any officer in the Navy or Marine Corps on the active or retired list while such officer is employed, after June 30, 1897, by any person or company furnishing naval supplies or war material to the Government; and such employment is hereby made unlawful after said date. * * *

The department recommends that this clause of the act of June 10, 1896, be repealed.

It is understood that this clause was originally passed in the early days of steel and armor manufacture when it was thought that the employment of officers by such concerns might have an influence on contracts entered into between their employers and the Government. The department believes that this view should no longer have any weight, since the number of firms entering into the manufacture of steel and other material used by the Government is so great that the interests of the Government are amply protected.

It is believed that it would be a distinct advantage to the country for retired officers skilled in technical matters pertaining to the Navy to be employed by private firms; the legal control which the Government has over these officers furnishes a guaranty which would prevent improper action on their part. This view is evidently held by foreign countries where such employment is permitted.

The law above cited is only operative against officers of the Navy and Marine Corps and does not exist for the Army or for any other branch of the Government.

ENLISTED PERSONNEL.

Reenlistments have been satisfactory, and the quality of men enlisted has been kept at a high standard, tending still to improve. The formation of the reserve fleets and commissioning of new ships of all classes have put heavy demands upon the personnel already short in numbers. Desertions and the kindred offense, absence overleave, have been dealt with strictly, with the result of reducing their number somewhat.

AMENDMENT TO ENLISTMENT LAWS.

The recently enacted amendments to the enlistment laws for the Navy, permitting men to serve for unbroken terms of from five to eight years, is expected to result in greater efficiency and increased return from the appropriations affected, and especially to save considerably in the outlay on training. The full effect may not be looked for until the enlisted men have satisfied themselves as to the merits of the new features, but some data of value may be expected in next year's report.

ENLISTED MEN'S RECREATION ROOMS.

Attention is invited to the need for amusement and recreation facilities for enlisted men at navy yards and stations. At any of our large home yards there are not infrequently 2,000 men or possibly many more. No diversion or form of indoor amusement is offered them except those that can be drawn from the city with its temptations. If reading rooms and wholesome amusements in a suitable building, under proper supervision and regulations, were established, comfort and contentment would be much increased, the pay of the men would be saved to them, many forms of temptation would be withdrawn, all reacting for the betterment of social conditions and discipline.

MECHANICAL TRAINING.

Believing that the efficiency of the fleet is essentially dependent upon the skill and training of its personnel, the department has consistently endeavored during the past year to improve the mechanical ability of both officers and men.

The personnel of the Navy is made up of persons of various mechanical ratings and ability—machinists, boilermakers, coppersmiths, pipe fitters, carpenters, shipwrights, painters—men of similar trades and rating with the men doing like work in the various allied trades on shore.

The Navy maintains at certain shore stations post-graduate schools for both officers and men—the Engineering Experimental Class and Station at Annapolis, the Electricians' School at New York, the Seaman's Gunners' School at Washington, the Machinists' Mates' School at Charleston, the Ordnance classes at Newport, Washington, and Indianhead, and the graduates of these schools returning to active service upon the completion of their apprentice and post-graduate courses have rendered valuable and intelligent service in their various callings. The training of radio-telegraph operators has been extended, and a separate specialty made for these men which will result in much improvement in the naval radio service commensurate with its increasing use and importance.

It is self-evident that no man can attain to highest efficiency in his calling if he be not familiar with the tools and appurtenances that pertain thereto, and that an ability to rise equal to emergencies can be hoped for only when there exists a knowledge and ability to successfully perform the various duties of his station.

DETENTION SYSTEM OF PUNISHMENT FOR NAVAL OFFENSES.

While it has long been recognized in theory that the naval prisoner undergoing punishment for offenses against discipline is not a "criminal" in the sense in which that term is commonly understood, nev-

ertheless, in fact, little distinction existed in the past between such naval prisoner and the criminal in civil life convicted of offenses which brand him as a menace to organized society. Both alike were subject to confinement at hard labor in penal institutions, where they were garbed and treated as "prisoners" and could not escape the ignominy which everywhere attaches to the name.

Appreciating the situation, the department appointed a board of officers to consider and recommend desirable reforms. The conclusions of this board, which were published in full in the Judge Advocate General's annual report for the fiscal year 1911, led to the inauguration of a "detention system" for offenders against discipline. The naval reservation at Port Royal, S. C., was selected as the site of the first "United States Naval Disciplinary Barracks." Regulations were adopted for the government of the barracks, which provide in brief that enlisted men confined therein shall continue to wear the service uniform and shall be known as "detentioners" instead of "prisoners;" that they shall be put through a carefully selected course in service drills and instruction so that at the end of their detention, if recommended as desirable, they may be returned to the service as proficient as possible; that after a detentioner has served two-thirds time with excellent conduct, or three-fourths time with good conduct, he shall be placed on probation at the disciplinary barracks for the remainder of the period of confinement to which he was sentenced, during which probationary period he shall be allowed liberty and given the same amount of work and responsibility as if restored to active duty in the service. Only such men are sent to the disciplinary barracks as have been convicted of purely military offenses and whose records indicate that they may become desirable members of the service; those convicted of offenses involving moral turpitude or violation of general laws, and those who have been guilty of repeated offenses against discipline, are sent to State or naval prisons.

In order that there might be as little as possible of the prison aspect at the disciplinary barracks, it has been the endeavor of the officers in charge to make the barracks in effect a correctional school and particularly to avoid the features of a naval prison. Nevertheless, it has never been the intention to make the disciplinary barracks attractive to enlisted men confined therein; but on the contrary, the rigid routine of drill and useful work, which is at all times maintained, is very exacting and calculated, when combined with deprivation of liberty, to render those who have once experienced such discipline reluctant to expose themselves by further misconduct to a second term of confinement in the disciplinary barracks.

The results to date may well be said to justify the action taken by the department in adopting the detention system in the Navy.

After observing for several months the operation of the disciplinary barracks at Port Royal, the department felt warranted in establishing similar barracks on the west coast, which was accordingly done at the navy yard, Puget Sound, June 1, 1912. The short time during which the last-named barracks have been in operation does not afford any statistics of definite value.

PENSIONS OF INMATES OF NAVAL HOMES.

The department renews its recommendation made last year that legislation be provided placing inmates of naval homes on the same footing as inmates of soldiers' homes in regard to their pensions. The law requires that the pensions of such inmates of naval homes be paid in for the benefit of the Navy pension fund. In the case of inmates of soldiers' homes such pensions are held intact for their benefit upon discharge, or, under certain circumstances prescribed by law, a portion may be paid to a deserted wife or a dependent child. The same law should apply to pensions of inmates of naval homes.

COMPENSATION OF DEPARTMENT EMPLOYEES.

The department renews its recommendation of last year in regard to the compensation of the civilian clerical and technical force of the Navy Department.

NAVAL MILITIA.

Naval militia organizations of a number of States volunteered for active service in the fleet during the naval review at New York in October. The following State militia organizations were represented and, as a rule, detailed to vessels of the reserve fleet:

State organization.	Officers.	Men.	Vessel to which assigned.
Chicago, Ill	23	141	Montana.
Baltimore, Md	6	16	Birmingham.
Cleveland, Ohio	6	33	Indiana.
Toledo, Ohio	5	31	Massachusetts.
Duluth, Minn	4	45	Wisconsin.
Detroit, Mich	12	111	Tennessee.
Hancock, Mich	8	55	Kearsarge.
Erie, Pa	4	30	Chester.
Philadelphia, Pa	3	39	Kentucky.
Ashland, Wis	4	23	Iowa.
District of Columbia	3	43	Maine.
	78	567	

The officers and men were regularly enlisted for four years, with special proviso that they were to be discharged by special order of the Secretary of the Navy upon completion of the review and return of the reserve fleet to the Philadelphia Navy Yard.

The Washington, Baltimore, and Chicago organizations joined the fleet at Philadelphia and remained on board until the reserve fleet's

return to the Philadelphia yard; the other militia organizations joined the fleet at New York and returned to the League Island yard and received their discharges at that port.

In addition to the above organizations, the first, second, and third battalions of the New York State Militia took part in the review, and were detailed to ships of the active fleet at New York as below:

Organization.	Officers.	Men.	Vessel to which assigned.
First Battalion, New York City	2	21	Washington.
Second Battalion, Brooklyn, N. Y.	10	100	Missouri.
Third Battalion (Buffalo, Rochester, and Dunkirk)	5	49	Utah.
	6	37	Florida.
	4	37	Washington.
	3	36	Delaware.
	30	280	

These officers and men were not regularly enlisted, their travel expenses and subsistence being paid by the State of New York.

The officers and men of the militia were assigned to duties on board according to their rank or rating in the militia, the watch officers taking regular watch duty with the officers of the service and the men of the militia with the enlisted personnel.

These men assisted materially in the movement of the reserve ships which were short handed to the extent of having only their reserve crews on board. The highest praise was given by commanding officers to the seaman-like conduct and bearing of the militiamen attached to the various vessels.

The department urges legislation in accordance with its recommendation to increase the strength and efficiency of the Naval Militia.

VESSELS FOR NAVAL MILITIA.

The practical experience gained by officers and enlisted men of the Naval Militia by the use of naval vessels loaned to the various States has been well demonstrated by the creditable showing of some of the organizations. Vessels of the size and type most useful for this purpose are also in constant demand for general cruising in the West Indies and Central America and on the Asiatic station, but the Navy does not possess enough of them to meet both needs. It is recommended that vessels suitable for the above work and for the Naval Militia be built and equipped at a reasonable cost, as such an expenditure would be many times repaid by the increased efficiency of this branch of the national reserve.

NAVAL RESERVE.

Experience has demonstrated that in time of war our naval force must be at least doubled. This means that we should have a reserve

of about 50,000 men. There is a well equipped supply available, and means should be adopted to organize and train this supply. For this there must be authority of Congress for the enrollment of a National Naval Reserve, providing for yearly exercises, and making allowances for uniforms, equipment, drilling, rent, and other general expenses, and empowering the President to call the Naval Reserve into active service in time of war or threatened war.

Twenty-five thousand skilled men can be obtained from the honorably discharged men of the Navy, the Naval Militia, and various mechanical trades in civil life; the other 25,000 men are available among the merchant marine.

The information necessary for action by Congress is being obtained by an investigation which was begun early in October. The interest manifested in this preliminary investigation gives evidence that the reserve as contemplated will meet with the interest and approval of the men whose membership is desired.

The department recommends that legislation be enacted to permit the formation of a National Naval Reserve.

CONSOLIDATION OF THE NAVAL OBSERVATORY AND HYDROGRAPHIC OFFICE.

The department has had under consideration the plans for consolidating the activities of the Naval Observatory and Hydrographic Office. Both the Naval Observatory and the Hydrographic Office are employed in supplying the fleet with navigational equipment, both are concerned in the instruction of navigators; the Hydrographic Office controls the marine-surveying parties, yet the observatory provides and attends to the repair of instruments for them, instructs surveying officers in the use of astronomical instruments, and cooperates with them in the determination of longitudes. In numerous ways the two institutions have unity of interests and should harmonize and strengthen each other under one management.

ADDITIONAL LEGISLATION RECOMMENDED.

The department further recommends that legislation be enacted providing for: (1) Consolidation of naval examining and retiring boards; (2) administration of oaths by boards of inquest; (3) the administration of discipline in naval landing forces, authorizing division commanders to act upon records of summary courts-martial and to convene general courts-martial, authorizing commanding officers of naval stations outside the continental limits of the United States to convene courts of inquiry, and fixing the relation between the commanding officer of a naval transport and the commanding officer of a marine battalion embarked thereon; (4) naturalization

of naval aliens; (5) change in the manner of appointing fleet staff officers; (6) the issuance of medals of honor to officers of the Navy and Marine Corps not now entitled to receive them; (7) acceptance by retired officers of appointments in the diplomatic or consular service; (8) graded retirement of enlisted men of the Navy and Marine Corps; (9) the repeal of sections 1538 and 1539, Revised Statutes, United States.

Respectfully submitted.

G. v. L. MEYER,
Secretary of the Navy.

REPORT OF THE JUDGE ADVOCATE GENERAL.

NAVY DEPARTMENT,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, November 6, 1912.

There is submitted herewith the annual report of the operations of this office for the fiscal year 1912.

REFORMS IN THE ADMINISTRATION OF JUSTICE IN THE NAVY.

By the Navy Regulations the Judge Advocate General, in addition to other duties, is charged with "all matters relating to the supervision and control of naval prisons and prisoners" as well as with the duty of reviewing the record of proceedings of every court-martial held in the naval service. A general idea may be had of the volume of work which these duties entail when it is considered that the number of officers and enlisted men of the Navy and Marine Corps who were amenable to trial by court-martial during the past fiscal year was several thousand in excess of the male population of militia age (18 to 45 years) in the District of Columbia as shown by the 1910 census. In addition it should be remembered that naval courts-martial have jurisdiction not only of violations of laws and regulations governing the discipline and administration of the naval service, but also of every conceivable criminal offense committed by members of its personnel whether at sea or on shore, at home or abroad, with the single exception of murder committed within the territorial jurisdiction of the United States. This extensive jurisdiction is now divided between three classes of tribunals, viz, the general court-martial, composed of not less than 5 nor more than 13 officers; the summary court-martial, composed of 3 officers; and, lastly, the deck court, consisting of a single officer. The records of all these courts come to the Judge Advocate General for review, and each record, whether the accused be an officer or enlisted man, is carefully examined for the purpose of determining whether the proceedings have been in all respects legal and the punishment imposed not in excess of authorized limitations. In addition, the commanding officer of any naval vessel is authorized to impose certain minor punishments upon officers and enlisted men under his command—which power, however, as indicated by the data given below, is, in many cases, not exercised, it appearing that too general recourse is had to courts-martial for the

punishment of inferior offenses which might be dealt with by the commanding officer himself without the formality of a trial.

In recent years, and particularly during the last fiscal year, considerable attention has been given to reforms in the administration of justice in the Navy, which subject has occupied a large part of the time of the Judge Advocate General. While it has long been recognized, in theory, that the naval prisoner undergoing punishment for offenses against discipline is not a "criminal" in the sense in which that term is commonly understood, nevertheless, in fact, no distinction existed in the past between such naval prisoner, on the one hand, and, on the other, the criminal in civil life convicted of offenses which brand him as a menace to organized society. Both alike were subject to confinement at hard labor in penal institutions where they were garbed and treated as "prisoners" and could not escape the ignominy which everywhere attaches to the name. That a remedy should be found for this condition, so far as concerned the offender against naval discipline, has long been apparent. Accordingly the existing system of punishments for military offenses was carefully investigated and considered by a board of naval officers of which the Judge Advocate General was senior member; the report of which board, dated June 21, 1911, was published in full in my last annual report. In the conclusions of this board naval prisoners were divided into three classes, viz: First, the offender against naval discipline who may by intelligent treatment be converted into a valuable or desirable member of the naval service; second, the offender against naval discipline whose previous record affords little foundation upon which to base hopes of reform; and third, the "criminal," or one convicted of an offense involving moral turpitude or a violation of general laws of the country.

Pursuant to the report of the board above mentioned, the department adopted the policy of sending all offenders of the third class to State prisons instead of indiscriminately confining them, as was formerly done, with men who had been guilty of purely military offenses only, thereby exposing the latter to the evil influences incident upon association with criminals, properly so called. In other respects, no change was made and none is now recommended in the established system of dealing with offenders of the second and third classes whose retention in the Navy could reasonably be expected to prove only detrimental to the best interests of the service, and who are, accordingly, sent to State or naval prisons, as the case may be, with a view to their discharge from the Navy upon expiration of confinement. With no desire to stifle the good aspirations of the criminal or habitual offender, whose reformation is at once the ambition and goal of the professional criminologist, it is, nevertheless, recognized that considerations respecting the greater good of the Navy should at all times be paramount; that service in the Navy must be made an honorable career open to upright young men in all walks of life, who should not be deterred from enlistment by prospects of possible association with criminals. It has long been the policy and endeavor of the department not to enlist in the Navy persons who have previously been guilty of criminal offenses in civil life, and the same cogent reasons demand that those convicted of crime after enlistment should be separated from the service either immediately or upon

completing a period of confinement if sentenced thereto by naval court-martial.

As to the first class of offenders given above, namely, those guilty of offenses against naval discipline who may reasonably be expected to develop into desirable members of the service, an entirely different question is presented. With reference to this class of offenders the report of the board above mentioned embodied favorable recommendations concerning the inauguration of a "detention system," and steps were immediately taken to carry such recommendations into effect. The naval reservation at Port Royal, S. C., was selected as the site of the first "United States Naval Disciplinary Barracks." Regulations were adopted for the government of the barracks, which provided, in brief, that enlisted men confined therein should continue to wear the service uniform and should be known as "detentioners" instead of "prisoners;" that they should be put through a carefully selected course in service drills and instruction, so that at the end of their detention, if recommended as desirable, they might be returned to the service as proficient as possible; that after a detentioner had served two-thirds time with excellent conduct or three-fourths time with good conduct, he should be placed on probation at the disciplinary barracks for the remainder of the period of confinement to which he was sentenced, during which probationary period he should be allowed liberty and given the same amount of work and responsibility as if restored to active duty in the service; that if, at the expiration of the probationary period, his conduct warranted such action, the unexecuted portion of the sentence would be remitted and the man unconditionally restored to duty. This last provision makes it possible for any detentioner at the disciplinary barracks whose sentence includes dishonorable discharge to save himself from such a discharge.

This is, in brief, the principal object of the detention system—to transform the offender against law and discipline into a useful member of the service instead of simply giving him a term of imprisonment and then turning him adrift without the credentials generally necessary to secure honest employment in civil life, as was done under the old methods. However, aside from the help given the individual, if we succeed in reforming and retaining in the service, instead of dishonorably discharging, a certain number of our enlisted men, we have made an appreciable financial saving to the Government; because it costs a large sum of money to enlist, transfer to one of the coasts, supply original outfits of clothing, and give the first instructions to each recruit. In addition, in the case of prisoners restored to duty instead of being dishonorably discharged from the naval service, the Government saves the cost of civilian clothing, transportation, and cash gratuity which the law provides for furnishing to discharged naval prisoners.

The mitigation of a man's sentence from imprisonment to detention is in all cases conditional, so that if his conduct at any time shall be such as, in the opinion of the Secretary of the Navy, to render his detention in the disciplinary barracks prejudicial to good order and discipline, the clemency exercised in his case may be terminated and the offender transferred to any prison designated by the department, where he will be confined at hard labor in accordance with the original terms of his sentence for the remainder of the period

adjudged therein. So, also, if a man's conduct while at the disciplinary barracks should not warrant his restoration to duty, the regulations provide that he shall be discharged from the service at the expiration of the period of confinement to which he was sentenced.

In order that there may be as little as possible of the prison aspect at the disciplinary barracks, it has been the endeavor of those officially connected therewith to make the barracks, in effect, a correctional school. In addition to the daily drills and work, detentioners are allowed and encouraged to take part in athletic exercises. Nevertheless, it has never been the intention to make the disciplinary barracks attractive to enlisted men confined therein, but, on the contrary, the rigid routine of drills and useful work which is at all times maintained is very exacting and calculated, when combined with deprivation of liberty, to render those who have once experienced such discipline reluctant to expose themselves by further misconduct to a second term of confinement in the disciplinary barracks.

As already stated, the first naval disciplinary barracks were established at Port Royal, S. C. This location was selected because of the generally temperate climatic conditions, permitting of outdoor drills during the greater part of the year. These barracks have been in operation since September 1, 1911, and while it is yet too soon to determine definitely the results which may be achieved by the detention system in our Navy, the commanding officer's report for the 10 months ended June 30, 1912, is regarded as encouraging. The following data are taken from said report:

Report of general court-martial detentioners received at the United States Naval Disciplinary Barracks, Port Royal, S. C., from Sept. 1, 1911, to June 30, 1912.

DETENTIONERS.

	Navy.	Marine Corps.	Total.
Received	355	96	451
Reconfined for misconduct	31	7	38
Recaptured after having escaped from barracks		1	1
Restored to duty unconditionally	1		1
Restored to duty on probation	172	48	220
Transferred to prisons	9	1	10
Discharged	48	15	63
In detention June 30, 1912	156	40	196

PROBATIONERS.

Number of detentioners placed on probation	172	48	220
Restored to duty unconditionally	85	15	100
Discharged	4	1	5
Reconfined for misconduct	31	7	38
Deserted	2	3	5
On probation June 30, 1912	50	22	72

CHARACTER OF DISCHARGE.

Ordinary discharge	8	1	9
Medical survey	1	4	5
Undesirable for the service	6	6	12
Bad-conduct discharge	1		1
Dishonorable discharge, recommended for reenlistment	10	2	12
Dishonorable discharge, not recommended for reenlistment	26	3	29
Total			68

It is of particular interest to note from the above statement that of a total of 220 detentioners who were placed on probation at the disciplinary barracks during the period covered by the commanding officer's report only 5 deserted, although the probationers were allowed liberty and had opportunity to abandon the service had they been so inclined. It will further be noted that during the same period 38 probationers were reconfined for misconduct; this number combined with the number who deserted makes a total of only 43 men, or 19.54 per cent of the whole number on probation who may be regarded as having wholly or partially failed to justify the special clemency exercised in their cases. In short, the results to date may well be said to justify the action taken by the department in adopting the detention system in our Navy, while even better results may be expected in the future, as it is believed that the system will eventually prove so successful that men who have had several months' training at disciplinary barracks will exert a good influence on the newcomers and will do much in preventing them from again committing themselves.

After observing for several months the operation of the disciplinary barracks at Port Royal, S. C., the department felt warranted in establishing similar barracks on the west coast, which was accordingly done at the navy yard, Puget Sound, Wash., June 1, 1912. The short time during which the last-named barracks have been in operation does not afford any statistics of definite value.

When the detention system was inaugurated it was expressly provided in the regulations adopted by the department that enlisted men convicted of desertion should not be sent to disciplinary barracks in mitigation of the sentences imposed by courts-martial in their cases. This provision was due to the legislative policy which prohibited the reenlistment of such deserters in the naval service as well as rendering them forever incapable of holding any office of trust or profit under the United States or of exercising any rights of citizenship thereof. However, by the act of August 22, 1912, these disabilities as to deserters in time of peace were removed, and such deserters may now, in the discretion of the department, be reenlisted or retained in the Navy to serve out the unexpired portion of their enlistments. Accordingly, certain convicted deserters are now sent to disciplinary barracks under the same rules and subject to the same conditions as other offenders.

One of the benefits resulting from the detention system which is deemed particularly worthy of comment is that detentioners, after serving satisfactorily two-thirds or three-fourths, as the case may be, of the confinement to which sentenced, are restored to duty on probation *at the barracks* instead of being transferred to general duty in the service, as was formerly the practice when such men were confined in naval prisons. As a result of this fact the conduct of such probationers is at all times carefully observed by the officers in charge of the barracks and a more satisfactory conclusion reached as to the desirability of retaining such men in the service than was possible under the former system.

In the case of enlisted men confined in naval prisons it is provided by the rules issued by the department that after any such man has served one-half of the period of confinement to which sentenced he may make written request addressed to the Secretary of the Navy

to be restored to duty on probation. This request must be forwarded through the commanding officer of the prison with a recommendation of the latter, so that the department in acting upon such request may have the opinion of those who have had the prisoner under personal observation, which opinion is given consideration in connection with the man's whole record since he joined the naval service, the nature of his offense, and the interests of the service regarded from a disciplinary point of view. If such request is favorably acted upon the prisoner, as already stated, is transferred to general duty in the service on probation. Formerly it was required that a monthly conduct report of each man on probation be sent by his commanding officer to the Judge Advocate General. This requirement involved extra work on the part of certain commissioned and petty officers where the man was sent, with the natural consequence that there was a general tendency on the part of such officers to regard probationers as a source of more or less annoyance and an unwelcome addition to the command. Accordingly, the practice has now been changed so that no report is required in such cases unless the probationer commits an offense of such nature that his commanding officer believes that the probation should be terminated and so recommends. In such event the probationer is allowed to forward a written statement of his case with the report of the commanding officer for consideration of the department.

Men sent to the naval disciplinary barracks, while undergoing detention, forfeit all pay and allowances the same as enlisted men confined in naval prisons. In the latter case the department's attention was frequently called to the hardship which such forfeiture of pay caused members of prisoners' families, who oftentimes suffered greater punishment in consequence of such sentences than the prisoner himself. The practice accordingly developed in deserving cases, where the dependent relative is unable to work, is in destitute circumstances and would otherwise become an object of charity or a public charge upon the community, of remitting the forfeiture of pay under such circumstances on condition that the prisoner allotted such pay to those who were dependent upon him for support and who were in the above-described condition. The same practice has been extended to the cases of detentioners confined at disciplinary barracks. Whenever an appeal is received from alleged destitute members of a prisoner's or detentioner's family, the department requests an investigation thereof by the local mayor, chief of police, or board of charity, and has in the past been ably assisted by such authorities in determining whether special clemency of this nature should be exercised.

From the foregoing it will be seen that the whole subject of the treatment of prisoners in the Navy has, in general, been developed along modern ideas of prison reform. It is needless to say that this has resulted in placing a great deal of additional work upon the office of the Judge Advocate General, which is believed, however, to be fully warranted by the results which are being accomplished and the ability to give individual attention to the case of each offender in the entire service to the end that the greatest amount of good both to himself and to the Government may be obtained.

The following data concerning the work of this office for the fiscal year have been compiled:

GENERAL COURTS-MARTIAL.

Charges and specifications drawn up in this office during the fiscal year.

	Navy.	Marine Corps.	Total.
Officers	14	4	18
Enlisted men	1,160	264	1,424
Total	1,174	268	1,442

Charges withdrawn.

To other courts-martial	4
On account of insanity or physical disability	11
Prisoners escaped	3
By order of department	2
Total	20
Trial delayed beyond end of fiscal year	1
Total	21
Cases tried by order of the department	1,421

Trials held at each naval station.

Portsmouth, N. H.	33
Boston, Mass.	143
New York, N. Y.	365
Philadelphia, Pa.	267
Norfolk, Va.	286
Mare Island, Cal.	196
Puget Sound, Wash.	81
Annapolis, Md.	2
Port Royal, S. C.	13
Special	35
Total	1,421

Trials by order of officers authorized to convene general courts-martial.

	Navy.	Marine Corps.	Total.
Officers	8	3	11
Enlisted men	162	60	222
Total	170	63	233

Total trials.

	Navy.	Marine Corps.	Total.
Officers:			
By order of the Secretary of the Navy	11	4	15
By order of other officers	8	3	11
Total	19	7	26
Enlisted men:			
By order of the Secretary of the Navy	1,157	264	1,421
By order of other officers	162	60	222
Total	1,319	324	1,643
Grand total	1,338	331	1,669

Trials of officers.

Convicted	23
Acquitted	2
Total	25
Trial delayed beyond end of fiscal year	1
Total	26

Trials of enlisted men.

	Navy.	Marine Corps.	Total.
Convicted	1,265	315	1,580
Acquitted	52	9	61
Disapproved	2	.....	2
Total	1,319	324	1,643

Schedule of principal offenses.

	Navy.	Marine Corps.	Total.
OFFICERS.			
Absence without leave	1	.....	1
Absence without leave and drunkenness	1	.....	1
Absence without leave, drunkenness on duty, and conduct to the prejudice of good order and discipline	1	.....	1
Breaking arrest, absence without leave, and conduct to the prejudice of good order and discipline	1	.....	1
Conduct to the prejudice of good order and discipline	1	.....	1
Conduct to the prejudice of good order and discipline, and drunkenness	.....	1	1
Conduct unbecoming an officer and a gentleman, and conduct to the prejudice of good order and discipline	1	.....	1
Conduct unbecoming an officer and a gentleman, falsehood, and scandalous conduct tending to the destruction of good morals	.....	1	1
Conduct unbecoming an officer and a gentleman and scandalous conduct tending to the destruction of good morals	1	.....	1
Culpable inefficiency in the performance of duty	1	.....	1
Disobeying the lawful order of his superior officer and absence without leave	.....	1	1
Disobeying the lawful order of his superior officer and drunkenness on duty	1	.....	1
Drunkenness	1	1	2
Drunkenness on duty	2	.....	2
Drunkenness on duty and violation of a lawful regulation issued by the Secretary of the Navy	1	.....	1
Failing to obey the lawful order of his superior officer	1	.....	1
Neglect of duty	1	.....	1
Neglect of duty, falsehood, and conduct unbecoming an officer and a gentleman	.....	1	1
Scandalous conduct tending to the destruction of good morals	.....	1	1
Violation of a lawful regulation issued by the Secretary of the Navy, conduct to the prejudice of good order and discipline, and neglect of duty	1	.....	1
Violation of a lawful regulation issued by the Secretary of the Navy, neglect of duty, and through negligence suffering a vessel of the Navy to be hazarded	1	.....	1
Total	17	6	23
Acquitted	1	1	2
Trial delayed beyond end of fiscal year	1	.....	1
Total	19	7	26
ENLISTED MEN.			
Absence without leave or after his leave had expired	236	46	282
Absence without leave and breaking arrest	7	5	12
Absence without leave and fraudulent enlistment	.....	1	1
Absence without leave, or after his leave had expired, and conduct to the prejudice of good order and discipline	48	21	69
Assaulting another person in the service	3	5	8
Assault with intent to kill	1	.....	1
Assaulting a sentinel	5	.....	5
Assaulting and striking a superior officer or threat of same	3	3	6
Assaulting with a deadly weapon and wounding another person in the service	5	1	6
Assault with intent to commit rape	1	.....	1
Breaking arrest	2	2	4
Conduct to the prejudice of good order and discipline	40	12	52
Culpable inefficiency in the performance of duty	1	3	4
Desertion	503	64	567
Desertion and fraudulent enlistment	87	51	138
Desertion *and* conduct to the prejudice of good order and discipline, or breaking arrest, or scandalous conduct	10	4	14

Schedule of principal offenses—Continued.

	Navy.	Marine Corps.	Total.
ENLISTED MEN—continued.			
Disobeying a lawful order	18	5	23
Disrespectful in language and deportment to a superior officer	1	.....	1
Drunkenness	6	5	11
Drunkenness on duty	10	16	26
Falsehood	1	.....	1
Forgery	1	.....	1
Fraudulent enlistment	169	31	200
Leaving station before being regularly relieved	1	2	3
Manslaughter	1	.....	1
Neglect of duty	.....	6	6
Refusing to obey the lawful order of a superior officer	25	8	33
Resisting arrest	2	.....	2
Scandalous conduct tending to the destruction of good morals	35	8	43
Sleeping on watch or post	2	5	7
Sodomy	5	2	7
Theft	26	8	34
Using abusive, profane, or obscene language to a superior officer, or to another person in the service	4	.....	4
Violation of art. 14, A. G. N.; stealing, selling, embezzling, or unlawfully disposing of Government property	6	1	7
Total	1,265	315	1,580
Acquitted	52	9	61
Disapproved	2	.....	2
Total	1,319	324	1,643

SUMMARY COURTS-MARTIAL.

	Navy.	Marine Corps.	Total.
Records received and revised	9,202	1,864	11,066
Cases disapproved by the department	143	46	189
Acquitted	134	39	173
Bad-conduct discharges	1,493	325	1,818
Average trials per month	767	155	922

DECK COURTS.

	Navy.	Marine Corps.	Total.
Records received and revised	7,214	2,402	9,616
Disapproved	79	12	91
Acquitted	115	16	131
Average trials per month	601	200	801

Percentages of enlisted personnel in the Navy and Marine Corps tried by court-martial.

	Navy.	Marine Corps.
Total enlisted force July 1, 1911	47,612	9,370
Enlisted during the year (approximate)	17,674	4,310
Total during year subject to trial (approximate)	65,286	13,680
Tried and convicted by general court-martial during year	1,265	315
Percentage tried and convicted by general court-martial	1.94	2.30
Tried by summary court-martial during year	9,202	1,864
Percentage tried by summary court-martial	14.09	13.62
Tried by deck court during year	7,214	2,402
Percentage tried by deck court	11.05	17.56

MISCELLANEOUS.

Courts of inquiry received and examined	108
Courts of inquiry followed by courts-martial	14
Courts of inquiry followed by action other than courts-martial	16
Courts of inquiry in which no further action was deemed necessary	78
Boards of investigation received and examined	229
Boards of inquest received and examined	105

The number of trials by general court-martial has increased over last year. The number of trials by summary court-martial also increased as compared with last year, while the number of deck courts decreased; making a considerable increase of total court-martial work in this office. The number of courts of inquiry has greatly increased as a result of Changes in Navy Regulations No. 15 (art. 1649), requiring that a court of inquiry shall be held under certain circumstances in which such courts were formerly not mandatory. This increase is shown in the following table:

COURTS OF INQUIRY.

1909	11
1910	29
1911	37
1912	108

EXAMINING BOARDS.

Officers of the Navy:	
Examined for promotion	416
Failed professionally	9
Failed physically	18
Passed for promotion	389
Officers of the Marine Corps:	
Examined for promotion	12
Failed professionally	1
Failed physically	1
Passed for promotion	10

RETIRING BOARDS.

Officers of the Navy	46
Officers of the Marine Corps	3
Total	49

EXAMINING BOARDS OF CANDIDATES FOR ADMISSION TO THE NAVY AS OFFICERS.

Medical Corps:	
Examined	41
Failed professionally	7
Failed physically	15
Failed morally	1
Passed and appointed	13
Withdrew	5
Pay Corps:	
Examined	7
Failed professionally	1
Failed physically	1
Passed and appointed	5
Chaplains:	
Examined for admission	1
Failed professionally and mentally	1
Total number of examinations for promotion, Navy and Marine Corps	428
Total number of examinations for retirement, Navy and Marine Corps	49
Total number of examinations for admission to the Navy	49
Total	526

ROBT. L. RUSSELL.

REPORT OF THE CHIEF OF BUREAU OF YARDS AND DOCKS.

DEPARTMENT OF THE NAVY,
BUREAU OF YARDS AND DOCKS,
Washington, D. C., October 26, 1912.

The value of the work done during the fiscal year 1912 from appropriations under the cognizance of this bureau aggregated $8,644,173.54, divided as follows: Public works, $6,167,596.05; maintenance of yards and stations, $1,611,182.52; repairs and preservation of navy yards, $831,106.25; contingent, $34,288.72.

The expenditures of funds under the cognizance of other bureaus and the Secretary's Office, but supervised by this bureau, were as follows: Secretary's Office, "Depots for coal," $234,556.32; "Coal and transportation," $112,317.49; "Equipment of vessels," $134,561.30; Bureau of Medicine and Surgery, $375,210.33.

The total value of the work under the supervision of this bureau done during the fiscal year amounted to $9,500,818.98. There were 62 contracts awarded during the year, involving obligations amounting to $2,344,178.05.

DRY DOCKS.

At the beginning of the fiscal year the bureau had under construction three new dry docks of the largest size, at New York, Puget Sound, and Pearl Harbor, and the lengthening of the principal dry dock at Norfolk was nearing completion. Early in the year the Norfolk dry dock was completed, and the New York dry dock has since been officially accepted, both docks now being in regular service. The Puget Sound dry dock is approaching completion, lacking only removal of contractor's cofferdam and dredging at entrance, with some installation of machinery in the pump well. The contract for the dry dock at Pearl Harbor is being modified to provide for a usable length of 1,000 feet, so that it may take any ship which can pass through the Panama Canal. Great difficulties were encountered, both at New York and Pearl Harbor. The former was met by an original design and method of construction, and the latter by careful study, experiments, and tests. Large expenditures have been made in the repair and preservation of the floating dry dock *Dewey* at Olongapo, and this dock continues to provide needed docking facilities in Philippine waters.

POWER PLANTS.

The central power plant at Puget Sound was completed during the year, and those at Mare Island and Pearl Harbor have been under active construction and are nearing completion. Plans have been prepared and contracts are being awarded for a complete central power plant at the Naval Torpedo Station, Newport, R. I. With the completion of the central power plant at Mare Island, the consolidation of power plants in all navy yards may be said to be complete.

The bureau has been giving special attention to the method of operation of power plants and has been materially aided by an exhaustive report by Stone & Webster, experts on power-plant construction and operation, on the power plant at the Boston Navy Yard.

This well-known firm was first retained in September, 1904, by the then Secretary of the Navy, who propounded certain questions to them as follows:

1. How much power is there at each yard and what proportion of it is in use? How much reserve power should there be in each yard?
2. In a general way, how does it compare in volume with the power of other industrial plants with which you are familiar?
3. What would you do with the light and power plants in the navy yards if you were operating the yards as a private enterprise, bearing in mind its military intention?
4. If the plants are consolidated, is it possible to arrange for a second unit of supply from outside sources—i. e., city supply or from private corporations?

The Secretary further asked for their general ideas on the whole subject, both as to the amount of power on hand, the amount necessary, the economy of production, the economy of its use, and any other question that might occur to them.

The plants at Portsmouth, Boston, New York, Philadelphia, Norfolk, and Charleston were visited by the experts of the firm and a report made November 15, 1904, submitting the findings as to existing conditions and recommendations for consolidations, improvements, and additions thought necessary to provide efficient and economical service.

On February 16, 1905, the department, after mature consideration, directed the Bureau of Yards and Docks to undertake the consolidation of the various plants as contemplated by the act of April 27, 1904, and the work was at once undertaken and carried along as expeditiously as conditions and funds available permitted.

During the summer of 1911 the work of consolidation of plants having been practically finished, it was deemed advisable and appropriate that an examination should be made by the same firm of experts of one of the consolidated plants to determine and report its findings, particularly upon the following points, viz:

First. Whether the plant has been designed and constructed in accordance with their previous recommendations to the department.
Second. Whether the plant is being operated in the most economical manner.
Third. If not operated in the most economical manner, in what respect.

For this purpose it was necessary to turn one of the plants over to Stone & Webster for operation for a period of 30 days. The plant at Boston was selected for the purpose and instructions were issued giving the firm possession of the plant, access to all records of its past operation, and the assistance necessary to insure a complete and unrestricted examination and a full and impartial report. In July, 1912, the report was received. It indicates that a most exhaustive examination of the multitudinous details of the plant had been made. Consideration was given to the measurement of fuel, feed water, steam consumed by the various systems, electrical output, air compressed, methods of operation in the boiler room and engine room, maintenance of boilers and stokers, pumps, economizers, engines, coal crusher, turbines, auxiliaries, organization of personnel, accounting system, and other details and specific report and recommendation made as to each. The report has been made the subject of careful

study by experts in the department and steps taken to correct the deficiencies found and to provide further improvements designed to secure additional economies and higher efficiency. Copies of the report have been prepared and furnished to the officers in charge of the maintenance and operation of the plants at the various navy yards and stations for consideration of the various points brought out by the experts and the adoption of the improved methods and apparatus recommended by them wherever the local conditions require or permit. The output and cost of heat, light, and power at each plant is being carefully calculated and recorded and each officer in charge is being advised periodically of the results attained at each other plant so that apparent excesses may be investigated and the proper remedy applied.

PEARL HARBOR, HAWAII.

A 35-foot ship channel has been completed from the station to the sea. The six shop buildings will be ready to receive machinery in December. The power-plant building is practically closed in, and the plant itself will be in partial operation before the end of the fiscal year. Storehouse, administration building, marine barracks and quarters, and six sets of navy-yard quarters are under contract. Plans for the hospital buildings are in preparation, and work will be advertised shortly. Outside power distribution mains, conduits, roads, and other general yard improvements are actively under way. Plans are in preparation for the lumber storehouse, paint and rigging loft, pattern shop, storehouses, and latrine, authorized by the act of August 22, 1912. This act authorized an increase in the usable length of the dry dock to 1,000 feet. Supplemental agreement covering this change is ready for signature, and the contractors are proceeding with the work. Work is in progress on a concrete basin, with wharf to store 100,000 tons of coal and designed for future extension to double this capacity.

GUANTANAMO REPAIR STATION.

Appropriations for emergency repair station and for magazines were made by act of March 4, 1911. Allotments have also been made from the appropriation for depots for coal for 30,000-ton fuel-oil and 250-ton gasoline station. Work has been actively prosecuted during the past year, and at the present time there have been completed the station wharf, the fuel-oil wharf, foundations for several of the oil tanks, and 60 per cent of the filling in of the site. Steelwork for all the shop buildings has been delivered, and the erection is proceeding rapidly. Power-plant equipment is on the ground, and the foundations for machinery are being placed. Practically all the materials for the work have been sent from the United States, and the larger portion has already been delivered. Two fuel-oil tanks, water tank, and gasoline tank have been shipped, and the pipe line from the oil tanks to the wharf is now being laid. The remaining fuel-oil tanks have been contracted for. All the materials for construction work at the magazines are being assembled, but active work on the site has not commenced, pending the department's decision as to possible change in location. Investigations are being made on

possible sources of water supply for station in case it should be further developed, and borings have been taken and test piles driven on the site of a possible dry dock. The location of this station with respect to material and labor markets has made it extremely difficult to carry on construction work with rapidity. Every effort is being made, however, to secure the completion of this station by the end of the present fiscal year.

NAVY YARDS.

In addition to the particular classes of work already mentioned, rapid progress has been made on a large number of miscellaneous items of public works at various yards and stations. Most important of these have been the water-front improvements at New York, Philadelphia, Norfolk, and Key West, and the foundry at Washington.

HOSPITALS.

Work has been carried on during the year on the three large hospitals of practically identical construction at Portsmouth, Chelsea, Mass., and Newport. Work under the contract for the three buildings is practically complete. There remain to be constructed power houses, quarters for officers and attendants, and other detached buildings. Plans for a general hospital at Pearl Harbor have been developed, and the work is nearly ready for advertisement. Miscellaneous small improvements have been carried out at various other stations.

MARINE BARRACKS AND QUARTERS.

Plans are in preparation for marine barracks, Philadelphia, and marine officers' quarters have been constructed at Philadelphia and Norfolk on plans prepared at the bureau. Minor improvements have been carried out at various other stations. Marine barracks and quarters for Pearl Harbor are under contract.

MAGAZINES.

Construction work is either under way or has been completed at nine separate stations, aggregating over $260,000. In addition, plans have been prepared or construction has been started for additional work aggregating over $390,000.

150-TON FLOATING CRANES.

The act of March 4, 1911, authorized two floating cranes of 150 tons capacity for Boston and Pearl Harbor, the limit of cost of the two being $660,000. The pontoons have been completed, and the erection of the superstructure and machinery is proceeding satisfactorily.

RADIO STATIONS.

The station at Arlington, Va., including one 600-foot tower and two 450-foot towers and several buildings, has been completed. Proposals will shortly be opened for a wireless station at Guantanamo, Cuba.

FUEL OIL AND GASOLINE STORAGE PLANTS.

Fuel-oil stations have been completed at Melville, R. I., Norfolk, Charleston, and Key West. The oil station at Guantanamo is in process of erection. Extensions have been authorized at these places, and active construction work is under way. A gasoline tank is also being erected at Boston. A 25,000-ton plant has been designed for Pearl Harbor, and the tanks and other material for 5,000 tons of fuel oil and 250 tons of gasoline are under contract.

COAL-STORAGE PLANTS.

The coal-storage plant at Tiburon, Cal., has been completed. The bureau has made designs for coaling plants of 200,000-ton capacity at Boston, Norfolk, and Pearl Harbor. Funds have been allotted to commence the construction of the plant at Pearl Harbor, and work is being actively prosecuted.

H. R. STANFORD.

REPORT OF THE CHIEF OF THE BUREAU OF NAVIGATION.

DEPARTMENT OF THE NAVY,
BUREAU OF NAVIGATION,
Washington, D. C., November 6, 1912.

Rear Admiral R. F. Nicholson, United States Navy, was chief of the Bureau of Navigation for the first six months of the fiscal year 1912, and was relieved by the undersigned on January first.

* * * * * * *

NAVAL REVIEWS.

A comparison of the mobilization of the United States Atlantic Fleet at New York from October 30 to November 2, 1911, with that held October 12 to 15, 1912, shows a marked increase in naval force in one year.

	Comparison.		Increase.
	1911	1912	
THE FLEET.			
Battleships	24	31	7
Armored cruisers	2	4	2
Smaller vessels	72	88	16
Displacement (tons)	576,634	720,486	148,852
PERSONNEL.			
Officers	1,124	1,378	254
Enlisted men	25,378	28,031	2,653

The above statement for 1912 includes 78 officers and 567 men of the various Naval Militia organizations who were enlisted and distributed among the various vessels of the Atlantic Reserve Fleet. In addition, 30 officers and 280 men of the first, second, and third battalions, New York State Militia were on board certain vessels of

the Atlantic Fleet, but were not regularly enlisted as the other militia organizations were.

The following State Naval Militia vessels, manned by their own officers and men, also participated in the review at New York:

State.	Vessel.	Officers.	Men.
Connecticut	Machias	17	88
New Jersey	Marietta	10	69
Do	Vixen	4	51
New York	Wasp	6	29
Do	Gloucester	11	50
Rhode Island	Aileen	5	24
Total		53	311

NAVAL MILITIA EMPLOYMENT.

Naval Militia organizations of a number of States volunteered for active service in the fleet during the naval review at New York in October. The following State militia organizations were represented and, as a rule, were detailed to vessels of the reserve fleet:

State organization.	Officers.	Men.	Vessel to which assigned.
Chicago, Ill.	23	141	Montana.
Baltimore, Md.	6	16	Birmingham.
Cleveland, Ohio	6	33	Indiana.
Toledo, Ohio	5	31	Massachusetts.
Duluth, Minn.	4	45	Wisconsin.
Detroit, Mich.	12	111	Tennessee.
Hancock, Mich.	8	55	Kearsarge.
Erie, Pa.	4	30	Chester.
Philadelphia, Pa.	3	39	Kentucky.
Ashland, Wis.	4	23	Iowa.
District of Columbia	3	43	Maine.
Total	73	567	

The officers and men were regularly enlisted, with special proviso that they were to be discharged by special order of the Secretary of the Navy upon completion of the review and return of the reserve fleet to the Philadelphia Navy Yard.

The Washington, Baltimore, and Chicago organizations joined the fleet at Philadelphia and remained on board until the reserve fleet's return to the Philadelphia yard; the other militia organizations joined the fleet at New York and returned to the Philadelphia yard, where they were discharged.

In addition to those organizations the First, Second, and Third Battalions of the New York Naval Militia took part in the review and were detailed to ships of the active fleet at New York as below:

Organization.	Officers.	Men.	Vessel to which assigned.
First Battalion, New York City	2	21	Washington.
Second Battalion, Brooklyn, N. Y.	10	100	Missouri.
Third Battalion, Buffalo, Rochester, and Dunkirk	5	49	Utah.
	6	37	Florida.
	4	37	Washington.
	3	36	Delaware.
Total	30	280	

These officers and men were not regularly enlisted, their travel expenses and subsistence being paid by the State of New York.

The officers and men of the militia were assigned to duties on board according to their rank or rating in the militia. The watch officers took regular watch duty with the officers of the service, and the men of the militia with the enlisted personnel. They assisted materially in the movement of the reserve ships, which were short handed, having only their reserve crews on board. The case of the *Montana* is an example of the aid given by the militiamen, inasmuch as she developed a speed of 18½ knots on half boiler power on the trip to New York; and during the return trip to Philadelphia all the vessels engaged in a steaming competition with excellent results. The highest praise was given to the militiamen by the captains of their ships for their seamanlike conduct and bearing.

DETAIL OF OFFICERS.

The bureau has adopted a system of rotation in duty at sea, so that officers will be given details in each of the fleets and in small craft, as well as in capital ships, during their careers. In making out the schedule of changes to take effect during the year, each officer's record is studied and his detail is governed to a great extent by the nature of his previous sea service in connection with his reports of fitness. It is hoped that the effect of this system will be that duty of all kinds and on all stations will be shared alike by all officers.

OFFICERS' AND ENLISTED MEN'S QUALIFICATIONS.

A card system is now going into effect by which all professional qualifications and preferences for duty of any officer can be instantly determined, and by which the names of all officers having desired qualifications or preference can be instantly determined.

The bureau is also putting into effect a more complete record of enlisted men qualified in the various duties which will enable it to make details to these duties in accordance with the needs of the service and the qualifications of the men.

This need has been shown by the fact that men specially trained in torpedoes, radio work, and other technical branches are often lost track of and have been found assigned to general duties.

CIVIL EMPLOYMENT OF RETIRED OFFICERS.

Attention is invited to the recommendation in last year's report of the Secretary for the removal of the restriction on the civil employment of officers which has been operative since June 10, 1896. This restriction was originally made in the early days of steel and armor manufacture in this country, when it was thought that the employment of officers by such concerns might have an influence on contracts between their employers and the Government. This prohibition applies to employment in any concern which has a contract with the Government, so that little employment is possible for retired officers. The restriction works especial hardship on naval and marine officers, since it does not apply to officers of other branches of the Government.

Experience abroad is that a distinct advantage to the country results from the employment of retired officers by private firms—a practice which utilizes the skill which these officers have acquired in the Government service, while at the same time the Government has a legal control over them, guaranteeing against improper action on their part.

PHYSICAL EXERCISE.

Regular physical exercise was first prescribed in a general order dated January 4, 1909. This exercise consisted of a walk of 50 miles in 3 consecutive days; a ride on horseback of 90 miles in 3 consecutive days or a bicycle ride of 100 miles in 3 consecutive days. It continued through the years 1909 and 1910. For the calendar year 1911 the exercise was changed to a quarterly walk of 25 miles in 2 consecutive days, 12½ miles each day, and for 1912 it was changed to a monthly walk of 10 miles in 1 day, in not more than 4 nor less than 3 consecutive hours. Within the tropics, where the temperature is 80° Fahrenheit or above, the distances walked and the time limits are two-thirds of those under normal conditions.

Before taking the first monthly exercise in each year each officer is examined by a board of medical officers to determine whether he is physically fit to perform all the active duties of his grade and whether the prescribed exercises may be taken without danger to him. No one is excused from the exercise except for physical disability.

PAYMASTERS' CLERKS.

It is recommended that a permanent corps of paymasters' clerks with warrant rank be established. The present body of clerks is constantly changing, as every time a paymaster is detached from his duty the appointment of his clerk (in many cases, two clerks) is revoked and the latter is ordered to his home. After arrival home he may be reappointed with the same or some other paymaster or he may never be reappointed. This leads to much confusion, increases the charge to the travel appropriation, and, it is believed, reduces very much the efficiency of the clerks themselves on account of the lack of stability in their positions. If belonging to a permanent corps, the clerks would perform their quota of sea and shore duty like other warrant officers, irrespective of the paymaster with whom they may serve, their details having no relation to that of the paymasters. The clerks should be bonded for a small sum.

Congress has provided for a retired list for paymasters' clerks, but under the present system its benefit may be lost entirely by able clerks long in the service if they happen not to be employed at the time some disabling accident or sickness may occur to them or on the day of reaching the retirement age. It would appear also that Congress contemplated a permanency of tenure in establishing a retired list.

Should a permanent corps be established, it would afford a line of advancement for the yeomen class in the Navy, which is now not eligible to promotion to warrant grade. Such a scheme of advancement could readily be effected by having promotions to the grade of paymasters' clerks, similar to that of the grade of carpenter in the Navy, open to civilians and yeomen by competitive examinations. This would add greatly to the efficiency of the yeomen class.

CONDITION OF OFFICERS' LIST.

There is a continued shortage of line officers in the fleet, due to the increased number of vessels in active commission and in reserve.

In 1915–16 there will be officers enough to man the fleet, provided its size is no greater than at present; but the distribution of these officers through the grades of the line, as authorized by statute, will not be properly proportioned to the duties and total numbers. Unless the higher grades are increased, it will cause great stagnation in promotion. Under the operation of existing law there would be 1,921 line officers by July, 1916. How this number should be distributed in the various grades to meet the requirements of the service and how the law now in force would distribute them is shown, comparatively, as follows:

	Above lieutenant.	Senior lieutenants.	Junior lieutenants and ensigns.
To meet service requirements	566	738	617
By existing law	400	350	1,171

Of the 1,171 officers in the lowest two grades over 670 would be junior lieutenants, and at the rate of promotion now provided an officer would be 16 years in that grade, and could not become a commander under 58 years of age, leaving only 4 years before retirement for service as commander, captain, and flag officer. Needless to say this would mean a condition far more intolerable than that from which the personnel act of 1899 gave relief.

OUTPUT OF NAVAL ACADEMY.

The class of midshipmen entering this year will number about 265, or about 20 more than last year, making a total of about 770 at the Naval Academy. Next year the reapportionment of congressional districts in many States will add nearly 100 appointments, and it is expected that the entering class will number about 300, bringing the total nearly to the full capacity of the present accommodations for midshipmen.

The existing law governing appointments, however, provides that after June 30, 1913, each Senator and Representative shall have only a single appointment instead of two; so that the class entering in 1914, succeeding one of the largest on record, will be unusually small. Such fluctuations do not make for good administration, either of the Naval Academy or of the Navy at large. But the important consideration here is to safeguard the Navy's future supply of commissioned officers in adequate numbers, and to do this it is necessary to have the same number of midshipmen allowed.

No probable requirement is now foreseen for more officers than could be supplied by the Naval Academy without enlarging existing accommodations. For the next few years the numbers graduated will suffice for vacancies and necessary increase, including the staff corps and the Marine Corps. If there were a decrease in the size of classes, it could only result in impaired efficiency for lack of sufficient officers.

The proposed personnel bill now before Congress contains provisions fixing the entrance ages for midshipmen at 15 to 18 years, and continuing the present number of appointments.

In connection with the age limits special attention was given in revising the Naval Academy curriculum to adjust the entrance examination so that the age limits could be lowered without hardship to the candidates. The aim was to make the entrance requirements and first year's work so conform to average school conditions outside that any boy of 15 to 18 who has been a faithful student may not feel the need of a course at a special preparatory school.

MIDSHIPMEN'S PRACTICE CRUISE.

The two-year cruise for graduate midshipmen was abolished by act of Congress March 7, 1912, making a radical change necessary in the form of practice cruise for the midshipmen during the summer. This year all members of the third class were sent to sea in one battleship, fitted out especially as a schoolship. This was but little different from former practice. The radical departure consisted in dividing the first and second class men among the battleships of the Atlantic Fleet, so many of each class to a ship. The second-class men were given duties and instruction mainly of a technical nature, in the engine and fire rooms and the electrical department. The first-class men had principally nautical and military duties and instruction. In addition, both classes were given work in navigation, radiotelegraphy, gunnery, and boating.

By thus dividing the midshipmen in small groups, and concentrating their attention on the professional branches for a whole cruise, the instruction imparted is much more thorough and practical than it could be in a schoolship, where less opportunity for practice can be given to individuals. The greatest advantage, however, is derived from the fact that their training is now given under normal conditions in the fleet, the regular fleet routine being followed instead of one made especially for use on board a schoolship. The conditions are such as to impress upon them a sense of their being officers with responsibilities. Because of this the practice cruise work will be given more weight than heretofore in determining class standing, which will encourage all midshipmen to serious work and enable those of good practical aptitude, but only average scholastic ability, to gain higher standing than they could win by studies alone.

The final result will be that on graduation as ensigns these young officers will go aboard ship better prepared and with more confidence than if their previous sea training had been in Naval Academy schoolships. Reports so far received are very favorable to the new plan.

ADMINISTRATION OF DISCIPLINE AT NAVAL ACADEMY.

Heretofore for every offense, trifling or serious, a demerit mark has been placed on the midshipman's record, which affects his standing throughout his entire career. There is, however, an inequality among the first-year midshipmen, due to different age, experience, and preparation, which makes it advisable not to count the first years' conduct record in making up the final merit for the class

after the four-year course. During the first year offenses committed will be punished by deprivation of privileges, extra drill, etc. Incorrigible behavior will result in dismissal. Demerits will still be given during this period as a temporary record, and the limit allowed in the year will be the same, but the members of the class who keep within the limit will begin the second year on an equal footing. The first year will thus be one of preliminary training in discipline and in forming the habits of a military mode of life. Each of the other three classes at the academy will in turn be held to stricter accountability, as their longer period of service at the academy should make them more reliable in personal conduct. Such an increasing standard is not a new feature, but the successive differences are to be made greater than before.

Offenses have been classified under three heads, namely: (*a*) Offenses due to youthful ignorance, inexperience, or undevelopment of habits; (*b*) those due to excess animal spirits and undeveloped responsibility; and (c) those of willfulness, indifference, or indicating a defective sense of honor, morals, or responsibility.

The scale of demerits has been revised and also the value of each demerit when used as a punishment to cause loss of standing. Except for special offenses where extenuating circumstances have caused demerits to be awarded in place of dismissal, the maximum number awarded for a single offense has been reduced to 50, but the weights have been increased so as to make a demerit cost more than formerly. Minor offenses will reap summary and appropriate punishment, providing the limit of demerits for one year is not exceeded, but for a serious offense the penalty will reduce class standing.

Finally, it is provided that a midshipman may redeem misconduct by exceptionally good behavior for a protracted period. This will not apply to first-class men who will be expected to have learned the value of good behavior.

CHANGES IN THE NAVAL ACADEMY CURRICULUM.

The examination for entrance to the Naval Academy has been changed by eliminating the subject of general history and allowing more examination time in all subjects. The first year's work will be more elementary, in order to strengthen the groundwork for the ensuing years; more time is given to English studies and foreign languages, and the more theoretical and advanced professional features have been eliminated or abridged. Spanish becomes the paramount language, with French next, and the Berlitz system of teaching is adopted. In general, the changes will readjust the early part of the course more nearly to average school conditions throughout the country and make the whole course broader and more thorough as a general education, and more practical in its professional application. Professional instruction is confined to the requirements of the grade of ensign, leaving the higher and special qualifications to be acquired in service and in post-graduate courses.

WAR COLLEGE.

This year it was found possible to order a larger class than usual to the War College summer course, and also for the long course. Next year it is hoped to enlarge the number taking the long course.

SPECIAL ORDNANCE INSTRUCTION.

Nine officers took the special course in ordnance instruction during the past year. Two received instruction at George Washington University in the chemistry of explosives, while the remainder took up the various forms of ordnance work on shore. Their study has been carried on with gratifying results.

SCHOOL OF MARINE ENGINEERING.

Seventeen officers attended this school during the year. During the summer the members of the class that completed the first year's course visited a number of manufacturing plants where opportunities were courteously afforded them to study the methods used. The results of these visits were of great benefit, not only in professional information obtained, but in the contact they afforded with well-known engineers and professional men. The class that completed the whole course was sent, in preparation for sea duty, to the navy yard, New York, and made a close study of the methods at that yard, the organization, and the relation between the yard and vessels undergoing repair.

POST GRADUATE COURSES.

The School of Marine Engineering, established at Annapolis in 1909, has been merged into a post-graduate department of the Naval Academy, recently constituted as a part of the academy, but entirely separate from the midshipmen's course and independent of the academic board. The head of the post-graduate department controls and conducts its executive and administrative work, under the government of an executive council, composed of the Superintendent of the Naval Academy, the head of the post-graduate department, the head of the academic departments of marine engineering and naval construction, ordnance and gunnery, electrical engineering, mathematics and mechanics, and physics and chemistry, the head of the engineering experiment station, a naval constructor, and a civil engineer.

Assignments of officers to these courses will, as a rule, be made after three years' service at sea and qualifying for promotion to junior lieutenant. The student officers will begin with four months' closely regulated and directed work at Annapolis in order to refresh and strengthen the theoretical knowledge previously acquired. Following this will be a second four months of preliminary specializing, though not necessarily at Annapolis, at the end of which it will be determined whether an officer's work justifies his continuing. If so, he will then pursue a chosen line of specializing for about 16 months more or longer.

The interest and cooperation of educators and experts in civil life will be especially sought in order that the students and the Navy

generally may be brought into closer touch with outside progress in science and technology.

THE NAVAL INSTITUTE.

The published proceedings of the Naval Institute furnish much professional and historical information, and help officers to keep in touch with naval progress. They also spread a wider knowledge of naval affairs among the large number of civilian members of the institute. The institute is to be congratulated upon its long career of usefulness and upon the high standard which it has maintained.

AMENDMENT OF ENLISTMENT LAWS.

Prior to the approval of the naval appropriation act for the fiscal year 1912 men or boys could be enlisted for the Navy only for terms of four years or minority, but this act now provides that a man may voluntarily extend his enlistment to make an unbroken term of service of five, six, seven, or eight years, and further extensions could be made by reenlisting for four years, and again extending that term if desired. At the same time the act preserves to the enlisted men all their rights and benefits under previously existing law, particularly those dependent upon honorable discharge. This new law will add no expense either now or in the future, but on the contrary will result in a decrease. As soon as the working of the law becomes well understood many will take advantage of it to serve an extra year or two, and probably many who would be unwilling to reenlist for four years would nevertheless extend their term for one or two years, and after serving this period would again choose to extend their term for one or two years more.

The department retains control over these extensions, so that only desirable men are allowed to obtain the benefit. In this way the services of more trained men will be retained than by the recent rigid rule of none but four-year enlistments. From men who extend enlistment the best can be selected for petty officers of the higher ratings, thus encouraging further extensions and saving a larger proportion of trained men to the service. This last, in fact, is the principal advantage of the new provisions of law.

The new law further authorizes the discharge of men whose terms of enlistment are almost completed when the remaining period of service is so short as not to be of use to the Government. This will be without prejudice to the rights of the enlisted man. The law obviates the necessity of having a considerable number of men on board receiving ships waiting for discharge, without rendering adequate return for their pay.

Economy under the provisions of this law will result outright in certain expenditures. As the new features grow in favor considerable reductions in the expenses for recruiting, transportation of recruits, outfits on first enlistment, and training of recruits can be expected.

DEMANDS UPON THE ENLISTED PERSONNEL.

This has been the first year in which the Atlantic Fleet has been kept to its quota of 21 battleships in full commission. This, together with the organization of the Atlantic and Pacific Reserve Fleets,

has made unusual demands on the enlisted personnel, and it was necessary to ask for an addition of 4,000 men to meet them. These will man the active fleet and give the reserve ships between one-third and one-fourth crews, according to the established plan approved by the department on May 1, 1912.

But already changes have been made in this plan, the *Tacoma*, *Des Moines*, and *Denver* having been placed in full commission—the *Cleveland* also for about two months—and the first group of destroyers has been kept in full commission. These demands, due to various causes, have resulted in making the active and reserve fleets short from 10 to 15 per cent of their allowed complements.

With this increased need for men came a summer of exceptional prosperity when recruiting slacked up, and there were heavy discharges of men; during July and August approximately 3,200 discharges.

In the past years the records show that from 2,000 to 3,000 men have been on general detail on the various receiving ships, available for service in case of emergency and to fill vacancies that normally occur on board cruising vessels. This year, however, the number has been considerably reduced, there seldom being as many as 500 men altogether available on all the receiving ships, so that when urgent need for putting ships in commission arose it was necessary to take men from vessels of the active fleet to fill these vacancies.

INCREASE IN THE ENLISTED PERSONNEL.

The figures furnished to the last Congress showed that a total of 51,500 enlisted men would be sufficient to man the active fleet and vessels in reserve as contemplated by the department's program, which was to become effective April 1, 1912.

The department has so far altered the number of ships in active service and in reserve as to make an additional 1,000 enlisted men necessary. The necessity of having cruisers and gunboats in the West Indies and Central American waters has made demands upon the enlisted personnel which were not contemplated, and as it appears that these conditions are liable to arise at any time, there should be a sufficient number of men in the service to man the vessels properly.

TRAINING OF ENLISTED PERSONNEL.

The training of enlisted personnel at the several training stations has been conducted under the direction of Capt. C. A. Gove, who relieved Admiral C. B. T. Moore on March 25, 1912, at San Francisco; Capt. W. F. Fullam at the Great Lakes Training Station; Capt. J. Q. Quimby at Norfolk, and Commander J. H. Dayton at Newport. Gratifying results have been obtained at the several stations, reflecting credit on the officers in command. Reports from the fleet on the product of the stations have attested to the efforts and care taken in training the recruits during the short period of their stay at the stations. The absence of any serious outbreaks of contagious or infectious diseases among the large number of men, coming from many sections of the country, is proof of the care and supervision in sanitary matters, which is an important feature of the work.

Due to the need for keeping the cost of transportation within the appropriation, it has been necessary to keep a slightly larger number of apprentice seamen at the two Atlantic coast stations than at the others. This is partly due to the decrease in enlistments at the recruiting stations in the Middle West during the time of harvesting, which has little effect on the Atlantic coast.

The musicians' classes at Norfolk, Newport, and San Francisco have supplied the service with musicians with some difficulty. The largest number under instruction is at Norfolk, where the class has been at times as many as a hundred.

The commissary schools at Newport and the training station, San Francisco, have furnished proficient commissary stewards, cooks, and bakers. Instruction in the duties of commissary stewards has been given ship's cooks to enable them to perform such duty in smaller vessels, or upon occasion of a vacancy or absence of a commissary steward on board a larger ship. Men from these schools have assisted at expositions where the Navy had an exhibit of ship's galley on board ship.

The artificer's class at Norfolk has afforded possibility of advancement in rating to men who have shown aptitude for mechanical work, and special training of men enlisted in mechanical branches. The relatively lower pay of carpenter's mates has caused some difficulty in filling this rate, but the output, both in numbers and qualifications, has been very good.

The schools for training electricians are located at New York and Mare Island. The establishment of the separate branch of electricians (radio) has been followed with an improved and lengthened special course in this branch, from which no graduates have yet been turned out. These measures will shortly relieve the demand for better radio operators. This change also allows more extended instruction in general electricity to be given. Separate examinations for gunners for electricity and gunners for ordnance now afford expert electricians an opportunity to compete on an equal footing with trained gunners' mates for the grade of gunner. This will deter competent chief electricians from accepting favorable offers of civilian employment upon the completion of a term of service which has made them proficient in electricity. Commander G. F. Cooper, lately in charge of the electrical class at New York, was of great assistance in reorganizing the method of instruction of the electrical classes and standardizing the course.

The machinists' mates' school at Charleston, S. C., has absorbed the similar school at Norfolk, which was discontinued April, 1912. It is now on a good running basis and graduated its first class of 62 men in August, 1912. Thirty-eight States were represented in this class. Its equipment consists of lathes, planers, shapers, drill press, milling machines, and boring mills with machinist, coppersmith, and tinning benches. The main engines of the *Ericsson* have been taken out bodily and set up on reenforced concrete foundation. The course is divided into four periods of four months each of practical work, with lectures at night in theoretical work. A nucleus of a technical library has been started. The need for this school has been urgent; and it is believed that the men turned out will meet the demand satisfactorily.

PHYSICAL TRAINING.

A scientific system of physical training, developed along lines successful abroad and in this country, has been established satisfactorily at the Naval Academy. From there it will be spread throughout the service, to replace the existing "physical drill," which, being more in the nature of exercise than training, leaves much to be desired. The new system will make for an improved habit of attention and alertness, as well as greater strength and activity, and will go far toward promoting team work in the crew of a ship. When established throughout the Navy, much improvement may be expected in physique and morale.

Swimming has been made a special feature. This applies to both officers and men in the fleet, as well as to midshipmen, whose diplomas of graduation are withheld until they fully qualify.

The physical training standard will be set at the Naval Academy, where all midshipmen will hereafter undergo a four-year course in it. Young officers will be the principal instructors afloat; but in order to provide qualified assistants, especially for the preliminary work and for the several training stations, 20 petty officers will be sent to Annapolis two or three times a year, making a class for a four-month training course. Surg. J. A. Murphy, who had much to do with introducing the system successfully at Annapolis, is now at the Newport Training Station, and later will go to the training station on the Great Lakes. By the time this is accomplished, a class of midshipmen will have been graduated and commissioned, well qualified by two years' training to be physical instructors in the fleet.

SERVICE RECORDS OF ENLISTED MEN.

Efforts are being made to standardize the markings of service records of enlisted men. There have been no established rules as to how these marks should be determined, consequently they have varied according to the policy on board the various vessels and at the different stations of the Navy, resulting in unequal marks for practically the same class of service. By establishing a standard method of marking throughout the service, an improvement will follow in the selection of men for promotion to the higher ratings. The necessity for a standard has also been felt by commanding officers in the awarding of discharges. The adopted method will insure more uniformity in granting honorable and ordinary discharges, a matter of great importance to the man, as his efforts to get employment in civil life are often determined by the character of a discharge.

ENLISTED MEN'S RECREATION ROOMS.

Attention is invited to the need for amusement and recreation facilities for enlisted men at navy yards and stations. At any of our large home yards there are not infrequently 2,000 men or possibly many more. No diversion or form of indoor amusement is offered them except those that can be found in the city with its temptations. If reading rooms and wholesome amusements in a

suitable building, under proper supervision and regulations, were established, comfort and contentment would be much increased, and many forms of temptation would be avoided. The result would benefit the service.

DESERTIONS.

The efforts made throughout the service to decrease the number of desertions have had good results. During the year the percentage of desertions was 3.52 as against 4.16 for the year previous, showing a gratifying decrease. The cause for this decrease may be accounted for—

1. By the directions of the bureau that only men who are of a high standard mentally, morally, and physically be enlisted; by requiring some evidence of good character before enlistment.
2. By requesting the parents or guardians of the newly enlisted man to encourage him to remain in the service.
3. By authorizing the early discharge of the undesirable and inapt, and those who have good cause for desiring discharge. The bureau believes that many desertions have occurred in the past because men have had family troubles or distress and have not been able to secure a release.
4. By the capture and speedy punishment of deserters.

Endeavor will be made to secure a spirit of competition on the various vessels in regard to reducing the amount of desertion and leave breaking, increasing the esprit de corps, and encouraging the officers and men to take greater interest in a small number of desertions on board their own ship. It is believed that this will lead to further satisfactory decrease in the percentage of desertions.

Below is a table showing the percentage of desertions for the years ending June 30, 1904, to June 30, 1912, inclusive:

Percentage of desertions for previous fiscal years.

Years.	Percentage.	Years.	Percentage.
1904	6.27	1909	5.50
1905	7.86	1910	4.77
1906	9.04	1911	4.16
1907	9	1912	3.52
1908	9		

PENSIONS OF INMATES OF NAVAL HOMES.

The bureau renews its recommendation made last year that inmates of naval homes be placed on the same footing as inmates of soldiers' homes in regard to their pensions. The law now requires that the pensions of such inmates of naval homes be paid in for the benefit of the Navy pension fund. In the case of inmates of soldiers' homes such pensions are held intact for their benefit upon discharge, or, under certain circumstances prescribed by law, a portion may be paid to a deserted wife or a dependent child. The same law should apply to pensions of inmates of naval homes.

NAVAL MILITIA.

To promote and increase the efficiency of the Naval Militia there should be a standard organization, professional and physical requirements for officers and enlisted men, and a uniform standard of discipline. There should also be systematic instruction, training, and inspections under the supervision of officers of the Navy. The bureau has detailed experienced officers to instruct the larger organizations and hopes that before long each organization can have the benefit of the advice and instruction of a regular officer.

The practical experience gained by officers and enlisted men of the Naval Militia by the use of naval vessels loaned to the various States has been well demonstrated by the creditable showing of some of the organizations. Vessels of the size and type most useful for this purpose are also in constant demand for general cruising in the West Indies and Central America and on the Asiatic station. The Navy does not possess enough of them to meet both needs. Vessels suitable for the Naval Militia could be built and equipped at a moderate cost, and such an expenditure would be many times repaid by the increased efficiency of this branch, which is the quickest available force outside of the regular service.

NAVAL RESERVE.

The necessity for a reserve naval force is recognized everywhere, even in those countries where the active force is maintained on a large scale.

Experience has demonstrated that in time of war our naval force must be at least doubled. This means that we should have a reserve of about 50,000 men. There is a qualified supply available, and means should be adopted to organize and train it. For this there must be enrollment provision for yearly exercises, and allowances for equipment and other general expenses.

Fifty per cent of a modern man-of-war's crew are skilled men. Of these a large number are dependent on their previous naval training for their skill, which is of an exclusive naval character; the remainder are men skilled in trades not exclusively naval. The sources of supply will then be the ex-service men of the Navy, the Merchant Marine, and the skilled trades on shore.

The information necessary for action by Congress is being obtained by an investigation which was begun early in October. The interest manifested in this preliminary investigation gives evidence that the reserve, as contemplated, would meet with the interest and approval of the men whose membership is desired.

STANDARD SHIP ORGANIZATIONS.

The organizations of ships are now being standardized so that all of one design will be the same and all of a type will have the same general features. The system of numbers for the men and other minor features will be as nearly alike as differences of design will permit. This improvement will enable the crew of one ship to be transferred to another of similar size without confusion, and, in general, officers and men detailed to different classes of ships will more readily learn their duties and stations.

RECEIVING SHIPS.

Before this year the receiving ships at the various yards were, with one exception, old unserviceable vessels, such as the *Wabash* and *Lancaster*. The six principal ones required 15 line officers, 18 staff officers, 5 marine officers, 11 warrant officers, and about 120 men each; and for each ship the annual expenditure for maintenance was about $15,000. Adding the officers' and the men's pay and the men's subsistence, more than $650,000 was spent yearly in connection with vessels no longer capable of active service.

Beginning April 1 a new system was inaugurated at the Philadelphia, Mare Island, and Boston yards, by which the receiving-ship business is carried on by a vessel in commission in reserve, ready on short notice to proceed on any duty assigned. The personnel, accounts, and rolls for the receiving-ship business are kept separate from those of the regular complement and duty of the ship as a cruising vessel in reserve, so that she may readily transfer the whole bodily to another vessel without the delay and labor involved in making out transfer papers. This is accomplished by designating the receiving ship, not by name, but as "The Receiving Ship." When the department designates a vessel, in addition to her status as a vessel in reserve, as "the receiving ship" at that place, those duties are taken up by her, and the receiving-ship personnel, property, accounts, rolls, and records become attached to her without further orders. This system requires fewer officers and men to conduct the receiving-ship business, and the cost of maintenance and repair of the old vessels, unserviceable for any other purpose, is saved; at the same time the services of all men on board the present receiving ship are available to care for a vessel that is in serviceable condition for active service. As soon as practicable it is proposed to establish the same system at other navy yards. Thus, ultimately, the personnel employed with vessels permanently stationary would be reduced by 600 or more, with a saving of nearly $100,000 a year on the upkeep of unseaworthy, insanitary hulks.

In the meantime other reductions have been made in the personnel employed in receiving ships, and changes have been made for the employment of other stationary vessels to the best advantage, as the *Reina Mercedes* and training brig *Boxer* from Newport to Annapolis, replacing the *Santee*, *Olympia*, and *Hartford*, the two latter going to Charleston as station ships, releasing the *Baltimore* for active service. The *Santee* is to be sold.

HISTORIC SHIPS.

The *Constellation*, built in 1797, with nearly a hundred years' cruising service to her credit, is now in bad repair. The *Hartford*, another wooden vessel, will still be capable of stationary service for some years; both these vessels can, with small occasional expenditure, be kept in their present condition almost indefinitely. The *Olympia* should be maintained in serviceable state for her present use for many years to come, and thus be preserved as a famous relic of the War with Spain.

While the vessels themselves are valuable as national memorials their names are worth still more. There are other ships of mem-

orable name still on the list, but not all are in employment appropriate to their history. The battleship *Delaware* is the sixth of her name; the armored cruiser *Washington* the fifth; the *Kearsarge* the second; but *Enterprise* (now sold) and *Essex*, names recalling the most daring exploits, are in the fourth generation borne by schoolships. Paul Jones commanded the first *Ranger*, but the fourth of that name is another schoolship.

The names of our most famous early vessels should be given to some of our best ships, as *Bon Homme Richard*, *Constitution*, *Alfred* (the first vessel to display a Continental flag), *Columbus*, *Congress*, *Franklin* (many years a flagship abroad, the present one having flown Admiral Farragut's flag in Europe), *Lexington*, *Niagara* (one of Perry's fleet on Lake Erie), and the *United States* (launched in 1797). Such reminders of worthy deeds in our history, if continued in association with the current national life, would be a constant inspiration to the country and the Navy.

The present law requires our first-class ships to be named after the States of the Union; the bureau believes that it should be made possible also to perpetuate historic names fittingly by giving them to some of our first-class ships.

STANDARDIZING SHIPS' LIBRARIES.

A standard ship's library has recently been adopted for all ships of the Navy, and the system of issuing the books has been modified. In the past it was the practice when a new book was adopted to list it in a catalogue which was published annually. These new books were issued only upon request from vessels, which had no opportunity to examine them, and were consequently unable to determine from the published titles which of the new works were the most valuable.

The new policy is to furnish immediately to all ships carrying a standard library all the works which are deemed of sufficient importance to be adopted. Better and fresher books are thus furnished. As the annual survey of one-third of a ship's library has been done away with the new system will also make for economy.

SPECIAL NAVAL LANDINGS.

The desirability of having suitable landings for the use of our own and foreign naval vessels at the larger and more important seaports of our coasts is becoming emphasized. In our larger home ports the naval anchorages have by local regulation or by custom become so fixed in their location and the number of such ports much visited is in reality so limited that this need could be met without serious expediture.

RADIOTELEGRAPHY.

Radiotelegraphy legislation enacted during the last session of Congress, though designed especially for the control and regulation of commercial interests, will have an important effect upon the naval organization. The bill of July 23, 1912, requires two or more operators and an auxiliary source of power upon all commercial ships. The act of August 13, 1912, requires the examination and license of all

private and commercial apparatus and operators within four months of the date of passage. Other provisions of the act of August 13 bring under executive control the operation of all radio apparatus in accordance with the terms of the Berlin convention. It also requires that naval stations be opened to commercial business in all places not fully served by commercial installations and that the rates for such service be fixed by the Secretary of the Navy. This, in effect, requires the establishment within the department of a complete commercial organization, capable of dealing directly, and making traffic arrangements and accounting with connecting land-wire and radio companies. Accordingiy the office of Superintendent of Radio Service has been established under the Bureau of Navigation for the purpose of administering all details connected with the commercial and military operation of the naval radio system. The Bureau of Steam Engineering will be charged with the technical work of supply, maintenance, and experiment; the Bureau of Navigation will furnish trained officers and radio operators and administer the system.

The development of radio for military uses of the fleet is advancing rapidly. Efficiency in this respect is dependent mainly upon skillful operators, improved apparatus, and progressive and intelligent supervision afloat. The assignment of a trained officer as fleet radio officer, the separation of radio electricians from electricians for other duties, and the revision of the instructions concerning the tactical use of radio, all recent measures, contribute to this end.

AVIATION.

In giving the aviation situation, both to show conditions in the Navy and in the aviation world generally, the bureau can not do better than to quote from a report just made by the bureau's aviation expert, Capt. W. Irving Chambers, United States Navy, to whose ingenuity and intelligent industry so much is due for the success so far attained. Great credit is due to the naval aviators who have pursued their dangerous calling without extra pay or allowances, although it is well known that no insurance company will write insurance on the lives of these officers:

As regards value in warfare aeroplanes have now passed out of the experimental stage to a great extent. Large sums have been appropriated by the powers to obtain the early advantages of their use for military purposes. In military maneuvers and in actual war their value to an army has been demonstrated beyond question.

The development of aviation for marine or naval purposes has been somewhat delayed, but inspired by the early demonstrations of our Navy the naval powers of the world are now devoting large sums of money to this phase of development. It may be asserted that although the aeroplane has not yet arrived at the state of perfection required, yet it is sufficiently advanced to be of great service in many ways, and its satisfactory development for extensive naval use is fairly in sight.

THE USES CONTEMPLATED FOR AVIATION IN NAVAL WARFARE.

(A) They can be carried, stowed, and used by all large ships—

(1) To reconnoiter an enemy's port or to search out his advanced bases and to assist in the operations of a blockaded or of a blockading force.

(2) To locate and destroy submarine mines, submarines and dirigibles, and to assist in the operations of submarines and torpedo boats.

(3) To damage an enemy's docks, magazines, ships in repair or under construction, dirigible sheds, and other resources.

(4) To provide means of rapid, confidential communication between a fleet commander and the commanding officer of a cooperating force on shore or the commander of another fleet or division.

(B) They can be carried by all scouts and large cruisers—

(5) To extend the "eyes of the fleet" in naval scouting.

(C) They can be carried, with ample supplies and camp outfit, on board any naval-supply auxiliary—

(6) For scouting at advanced bases and for extensive use with expeditionary forces.

The following statement, while it does not include all sums that have been appropriated by all nations, will serve to show the comparative interest that is manifested in aviation to-day by some of the powers:

	Government appropriation.	Popular subscription.	Total.
France	$6,400,000	$1,000,000	$7,400,000
Germany	1,500,000	750,000	2,250,000
Russia	5,000,000	(?)	5,000,000
Great Britain	2,100,000	(?)	2,100,000
Italy	2,000,000	100,000	2,100,000
Japan	600,000	(?)	600,000
United States	140,000		140,000

UNSATISFACTORY LIMITS IN APPROPRIATIONS.

In accordance with the policy of the department, as mentioned in the last annual report of the Secretary of the Navy, aeroplanes are now placed in the same category as other articles of a ship's equipment and are appropriated for accordingly, the general architecture and constructional features being provided by the Bureau of Construction and Repair under its general appropriation "Construction and repair of vessels," and the motive power, including radio apparatus, being provided by the Bureau of Steam Engineering under the appropriation for "Steam machinery," it being intended that the bureaus will do their share in providing the specific parts which naturally come under their cognizance in the department organization.

It seems unnecessary to place a limit on aeroplanes under these appropriations when expenditure on boats, steam steerers, windlasses, boilers, and "all other auxiliaries," costing much more, is unlimited. No economy is effected by placing a limit on any one of the numerous items under these appropriations, and no extravagance can occur by removing the limits on aeroplanes, because, regardless of limits, the amount of each appropriation remains the same and expenditure on each aviation item will be jealously guarded by the bureau concerned.

It is particularly unfortunate that the small limit of $20,000 is placed on aeroplane machinery this year, because our experience shows that each aeroplane used for instructions requires two motors to carry on the work effectively. This, of course, will be impossible under the present limit, as the expense of repairs is also comparatively great.

The plan thus far in our service is to restrict the shore establishment as far as possible, to place a few machines on shipboard at the earliest practicable date for test, and then to carry on the instruction in the midst of the fleet in a systematic way.

Our endeavor is to protect our aviators against their zeal by prohibiting sensational flights that are unnecessary to the progress of development; but it is due to them that they be encouraged in their work by a liberal extra allowance based on the time spent in actual flight and a liberal pension for those dependent on them in event of death due to this service.

Since April 1, 1911, when they were transferred to Annapolis, the four aviators who have been regularly engaged in the work of instruction have made 593 flights in the three Navy machines up to the end of August, 1912, the total time in the air being 126 hours 20 minutes, during which a distance of 6,422 miles has been traversed and 272 passengers have been carried.

Our navigators have demonstrated that hydro-aeroplanes can be readily flown at altitudes of 3,000 feet or more, where they are practically immune from rifle fire, and that the hydro-aeroplane is suitable for long flights. They have been the first to demonstrate that it is practicable to send aeroplanes in flight from ships, that it is possible to hoist them in and out like a ship's boat, and that it is possible to carry on instruction from a ship, using the water as an aerodrome. The work in progress indicates that they will soon be able to leave the ship in flight without more trouble or preparation than is required to discharge a torpedo from an upper deck and to continue in flight with the machine automatically controlled and comparatively safe.

Improved safety appliances will place the aviator in the category of a real aerial navigator comparatively free to navigate in fog or in darkness, by the aid of a real air compass, to observe, to communicate his observations by means of the wireless or other signaling apparatus, and to make long flights without undue exhaustion and in weather that renders flying uncertain at present.

But to hasten the development of inherent stability and to further increase the safety of machines by automatic mechanism, as well as to increase our knowledge of the science of aerial navigation in all its branches in the shortest possible time, the establishment of an aerodynamical laboratory is necessary.

NAVAL OBSERVATORY.

The observatory has continued its work of making astronomical observations, publishing the American Ephemeris and Nautical Almanac, supplying the fleet with navigational instruments, and establishing standard time and differences of longitude.

The department issued a circular letter on February 26, 1912, inviting all officers to submit to the Bureau of Navigation suggestions looking to the improvement of navigational methods or instruments. The circular was also sent to manufacturers of nautical instruments. The large number of responses to this circular, both from officers and civilians, have contained valuable suggestions. Numerous instruments or attachments to them have been tried, or arrangements are in progress for their trial, with a view to their adoption if found to be suitable or better than similar ones now in use. Improvements in navigation methods and text books are in preparation.

The observatory has given great attention to the development of the gyro compass. There were many defects in the first ones de-

livered, but they have been largely overcome. The first contract was for eight sets. A second contract for 10 sets has been entered into under very much more stringent specifications than in the first one. The utility of the gyro as a battle compass has been demonstrated and the bureau expects to supply one for each battleship and submarine.

With the completion of the powerful radio station at Arlington, the observatory is contemplating a time signal which will reach ships at great distances at sea. It is hoped to reach the greater part of the North Atlantic and North Pacific Oceans by this means. Plans are also being made to send radio signals for the determination of differences of longitude, and it is hoped that the first of these will be between the Naval Observatory and the Observatory of Paris via the Arlington Station and Eiffel Tower. Prof. Asaph Hall, United States Navy, of the observatory, was ordered to attend the conference held in Paris, October 15, 1912, to consider questions concerning radio signals from the Eiffel Tower for time and other purposes.

Numerous letters received at the observatory and articles in the technical press indicate that jewelers in various parts of the country are contemplating the use of radio apparatus in getting correct time daily. It is proposed to issue at an early date a pamphlet on standard time and time signals, with general information as to their reception by radio telegraphy.

HYDROGRAPHIC OFFICE.

During the year the Hydrographic Office has maintained the high standard of work it long ago established. Until May 26 the office was under the administration of Capt. John J. Knapp. He was relieved on that date by Commander George F. Cooper.

During the administration of Capt. Knapp the office rendered valuable service to the maritime world by the efficient manner in which it disseminated information concerning the *Titanic* disaster, which is fully set forth in the hydrographer's report. Prior to the collision of the *Titanic* with the iceberg the Hydrographic Office had given repeated warnings of bergs in the neighborhood of the steamship lanes crossing the Atlantic, and the office received a radiogram on the day the *Titanic* struck, indicating bergs very near her track. She, herself, transmitted this radiogram from the *Amerika*. The Hydrographic Office at once made public the message. The office immediately recommended to the steamship lines that they move the lanes south so that they would clear the ice fields. The department established for trial an ice patrol of the steamship lanes. This was very greatly appreciated by the maritime world and should be continued each year during the ice season. It would be advisable to have a special vessel for this purpose. It could locate dangerous bergs and floes and communicate their positions and the direction of movement to vessels by radio. The bureau recommends that the department plan to continue this ice patrol each year. It is properly a function of the Navy, and the information to be obtained is urgently needed by the Hydrographic Office for the protection of merchant shipping.

Arrangements are being made for reproducing by photolithography charts of foreign waters that are not now published by the office. When all these charts are published by the Hydrographic Office we shall be independent of foreign sources of supply charts for our navigation of foreign waters.

The survey work of the office has progressed rapidly during the year, there having been four parties in the field. One of these parties established the geographic positions of points on the coast of Cuba, many of which have long been in doubt.

The pilot charts continue to be one of the most valuable publications of the office and are the means of obtaining a great deal of data for the correction of charts and sailing directions. The preparation and publication of these pilot charts should remain under the supervision of men who are navigators and seamen by training.

The branch office at Port Townsend, Wash., should be moved to Seattle, and a coordinate branch of the same office established at Tacoma. A branch office should be established at Los Angeles, Cal. The shipping interests of this port, already great, will be much increased upon the completion of the Panama Canal. The branch office at Panama can not be established until an appropriation is made for it. The amount of the appropriation necessary is in the estimates for 1914.

The work of the Hydrographic Office still suffers from having only two officers on duty there.

CONSOLIDATION OF THE NAVAL OBSERVATORY AND HYDROGRAPHIC OFFICE.

Following the department's plan, the bureau has had under consideration the method for consolidating the activities of the Naval Observatory and Hydrographic Office. Both the Naval Observatory and the Hydrographic Office are employed in supplying the fleet with navigational equipment, both are concerned in the instruction of navigators; the Hydrographic Office controls the marine surveying parties, yet the observatory provides and attends to the repair of instruments for them, instructs surveying officers in the use of astronomical instruments and cooperates with them in the determination of longitudes. In numerous ways the two institutions have unity of interests and should harmonize and strengthen each other under one management.

Should the consolidation be effected, it would seem advisable to give the superintendent an assistant as director of the department of astronomical observations who would fill a position with reference to that department similar to that of the Director of the Nautical Almanac. This assistant should be a distinguished civilian astronomer, or an officer trained in astronomy. The question of suitability should be paramount and an adequate salary should be provided, if a civilian.

A building should be erected on the Naval Observatory grounds especially designed for the needs of the Hydrographic Office. This would greatly increase the efficiency of that office, as it has never had quarters especially adapted for its work. It would also be of very great value to the Navy Department by permitting it to move some of its crowded force into the space now occupied by the Hydrographic Office.

PHILIP ANDREWS.

REPORT OF THE CHIEF OF THE BUREAU OF ORDNANCE.

DEPARTMENT OF THE NAVY,
BUREAU OF ORDNANCE,
Washington, D. C., October 5, 1912.

The following report of the operations of the bureau for the fiscal year 1912 is submitted:

During the year many improvements in ordnance material have been made, but as information regarding these is considered confidential, it is not given in detail in this report.

The organization of the reserve fleets in the Atlantic and Pacific Oceans has thrown a large amount of additional work and expense on this bureau, in common with other bureaus, and the increased activity of the active fleet in target practice has entailed additional work and expense.

A large amount of experimental work has been carried on and designs are being prepared for advances in ordnance material which are not yet adopted. Many tests of new devices have been made, and it is felt that the net result of the year's work has been marked improvement in many details of ordnance material as well as in business administrative methods and that marked economies have been effected in the performance of work at the stations under the direct supervision of the bureau.

THE BUREAU.

The bureau desires again to call attention to the insufficient office space allotted to it, which results in officers and civil employees being so crowded together as to carry on their work under unfavorable conditions. The situation has been slightly relieved during the year by the acquisition of a portion of a room assigned to the Bureau of Steam Engineering, but at such time as conditions make it practicable additional space should be assigned to the bureau.

Legislation by Congress during the last session made it possible to secure a small number of additional clerks for service in the bureau and it is believed that the authorized clerical force is now sufficient for the present needs of the bureau.

A great deal has been accomplished during the year in the way of systematizing the bureau's work, particularly as regards the furnishing of supplies to vessels. This feature of the bureau's work is one which touches the fleet most closely, and is the one in which systematization is the best preparation for war conditions. It has been the bureau's object to arrange its work in such a way that no change in system or methods would be necessary in time of war or other emergency.

GUNS.

The manufacture of the guns required to arm the *New York*, *Texas*, *Oklahoma*, *Nevada*, and destroyers *43–50*, inclusive, has been carried on without interruption by the Washington Navy Yard, the Watervliet Arsenal, the Bethlehem Steel Co., and the Midvale Steel Co. Modifications have been made in a number of 12-inch, 8-inch, 6-inch, and 5-inch guns. All of these guns, as modified, have been

placed afloat to replace old batteries or are placed in reserve for such use in the future.

Work has been in progress on lining 50 guns of 8-inch caliber or above and more than 100 guns of caliber less than 8 inch. Relined guns are used for replacing worn guns afloat. Conical lining has been definitely adopted, and in future this method of lining will be used wherever practicable.

An eccentric type of breech plug has been adopted for cartridge-case guns other than those having a sliding-wedge type of breech mechanism. New breech mechanisms of the eccentric-plug type are being fitted to all 3-inch 50-caliber Mark III guns, and these guns, as rapidly as they become available, are being placed in service afloat.

A number of new batteries of 3-inch, 5-inch, 6-inch, and 12-inch guns have been placed on board ship, the old batteries having been withdrawn for modification or lining.

A number of guns of obsolete type, no longer of service to the Navy, have been surveyed and are reserved for loan to patriotic societies or for exhibition purposes.

GUN MOUNTS.

The triple-turret mount mentioned in the bureau's report for the year 1911 has been tested at the Naval Proving Ground and, subject to minor modifications, is satisfactory. The manufacture of the four mounts for the *Oklahoma* and *Nevada* is well under way. This type of mount will be adopted for the four turrets of the one battleship appropriated for at the last session of Congress.

The 14-inch Mark I mounts for the *New York* and *Texas* are nearing completion, and the entire turret design for these vessels is a decided improvement on previous designs. The 14-inch Mark I mount will be installed in the two-gun turrets of the *Oklahoma* and *Nevada*.

Vessels of the *New Jersey* and *Connecticut* classes are all being equipped with 8-inch tube shell hoists as the vessels become available. The 8-inch hoists for the above vessels, complete and ready for installation, have been completed at the Naval Gun Factory. Where the need was apparent certain vessels of the above classes have been fitted with 12-inch tube shell hoists.

Marked improvements have been made in turret telescopes, and the fleet has been supplied with telescopes embodying such improvements.

The ammunition handling arrangements of vessels of the fleet have been greatly improved.

POWDER.

Smokeless powder has been manufactured during the year under the same specifications and, in general, by the same methods as obtained during the preceding year. Numerous minor improvements have been made in methods of manufacture which tend to insure greater uniformity in product, the principal improvement introduced being one whereby the requisite amount of diphenylamine is incorporated in the powder without variation.

The manufacture of powder, as in the past, has been divided between the E. I. du Pont de Nemours Powder Co. and the Govern-

ment plant at Indian Head. The powder produced by the two establishments is practically identical in character and quality, the methods pursued being, in general, the same and differing only in minor mechanical details.

Experiments have been carried out with powders dried quickly at a high temperature, but these have not yet been carried to a point justifying a definite conclusion as to the value and safety of this method of drying nor as to the effect of the method of drying on the length of life of the powder.

During the year the bureau has been again called upon to reply to misleading statements appearing in foreign journals regarding the quality of American smokeless powder. Owing to the fact that the United States and France both use a nitrocellulose powder the deplorable accident to the French battleship *Liberte* furnished a basis for criticism of the American powder, and for assertions that disasters were to be anticipated in the United States Navy similar to those experienced in the French Navy. While the two powders are of the same general type, both being nitrocellulose powders, they differ materially in the kind of solvent used, and French official reports show that their methods of manufacture, blending, and reworking are so different from our own as to cause the two powders to be radically different. Recent reports from France are to the effect that all powder now in service is to be withdrawn and replaced by powder exactly like our own. The specifications under which smokeless powder is manufactured for the United States Army and Navy are very stringent in requiring absolute purity of all material used, exceeding care in every portion of its manufacture, and step-by-step inspection of the powder from the raw-material stage to the finished product. The regulations regarding stowage, care, and inspection of smokeless powder, both on shore and aboard ship, are comprehensive, and, so far as the bureau is aware, are very strictly observed. Since the adoption of the present type of smokeless powder by the Navy Department not one accident has occurred due to decomposition or spontaneous ignition of the powder—a record which is probably not paralleled in any other service.

No smokeless powder in which diphenylamine has been incorporated has as yet shown any signs of loss of stability, the oldest lot of powder containing this stabilizer being now four years old.

The experiments with ozokorite as an agent for reducing the erosion of guns were brought to a conclusion during the year, it having been determined that, while powder charges with which ozokorite was mingled produced less erosion than charges containing the same weight of powder but containing no ozokorite, the disadvantages attending the use of ozokorite more than offset its advantages.

The cost of production of powder at the Indian Head factory has been still further reduced during the year, owing, in part, to the fact that a larger quantity of powder was manufactured than during the previous year and partly to direct economies effected in the operation of the plant.

The question of installation of magazine refrigerating apparatus in various ships has arisen from time to time during the year and this bureau has consistently recommended its installation in all large vessels. The bureau can not refrain from emphasizing the fact that the immunity of the United States Navy from serious accidents such

as have befallen the French Navy has been due, in part, to the extreme care exercised to keep smokeless powder at a moderate temperature, and wherever the conditions are such as to make high temperatures in magazines possible a refrigerating system should be installed.

PROJECTILES.

There has been no marked change in the design of armor-piercing or common projectiles during the year, but armor-piercing projectiles of higher quality are now being furnished by contractors, partly as a result of the change in specifications referred to in the last annual report and partly due to the natural development of the art of manufacture. One additional firm has taken contracts for projectiles of this character, but has as yet made no deliveries. The bureau believes that the specifications now in force are as severe as can be met by the manufacturers, considering the present state of the art, but there has been no noticeable falling off in the number of successful tests as a result of increased severity of specifications.

The current specifications require projectiles to be furnished in larger lots than hitherto, a change which has materially reduced the work at the proving ground in testing projectiles, the number of lots tested during this fiscal year being 208, as compared with 370 during the previous fiscal year, with only a slight reduction in the total number of projectiles furnished.

An appropriation having been secured for the purpose of modernizing old projectiles on hand, this work has already been undertaken, and by the close of the fiscal year 1914 it is expected that all projectiles of old types which are of sufficiently good quality to warrant their being fitted with long-point caps and modern fuses will be modified to the present standard design.

Several firms have supplied target projectiles of excellent quality during the past year at prices not in excess of those previously paid. Projectiles of obsolete pattern now on hand and which are not of sufficiently good quality to warrant their being modernized for war purposes will be expended at target practice.

ARMOR.

Deliveries of armor by contractors during the year aggregated about 8,300 tons, and about 5,300 tons remain to be delivered to complete the *New York* and *Texas*.

Contracts were awarded during the year for about 15,300 tons of armor plate and appurtenances for battleships 36 and 37, the *Oklahoma* and *Nevada*, the contracts being allotted in practically equal amounts to the Carnegie Steel Co., the Bethlehem Steel Co., and the Midvale Steel Co.

The specifications for the armor for the *Oklahoma* and *Nevada* are slightly more severe than the previous specifications with respect to the ballistic test. No deliveries of armor for these vessels have as yet been made, the contracts not having been awarded until January, but it is not expected that the armor makers will encounter any serious difficulties in the manufacture of the armor or in meeting the slightly augmented requirements.

No radical changes in composition or methods of manufacture have been introduced during the year, and the quality of armor delivered has been substantially the same as of the armor hitherto furnished. Both cemented and noncemented armor is being supplied, and it can not be definitely stated that either type of armor is superior to the other. Firings against experimental plates made after both processes have shown the possibility of producing armor of slightly higher quality than that already manufactured, and a steady but slow improvement in quality is anticipated.

Special-treatment steel plates for turret tops have shown a steady improvement, owing to changes in composition and methods of manufacture.

FIELD GUNS, MACHINE GUNS, AND SMALL ARMS.

No contracts for the supply of field guns or machine guns have been entered into, other than those referred to in the last Annual Report, and it is believed that no additional guns of these types will be needed for some time to come.

The bureau's attention has been drawn to a new type of rifle-caliber machine gun, the invention of Col. I. N. Lewis, United States Army, which gun seems to present certain advantages over the type of gun now in service. The inventor has been requested to submit a sample gun for test, but has not as yet done so.

Further purchases of the latest model Springfield rifle have been made during the year, and all vessels of the active fleet are now equipped with them.

Arrangements have been made with the Ordnance Department of the Army to supply .45-caliber automatic pistols for the Navy of the same type as those now in use in the Army, and about 3,000 of these have been delivered.

A small number of Maxim silencers for use on the .30-caliber rifle have been purchased for issue to vessels and to training stations.

TORPEDOES AND MINES.

In so far as the design of material is concerned, the torpedo situation has greatly improved during the past year. The two new types of long-range, high-speed torpedoes referred to in the last Annual Report have been built and passed satisfactory test. Although it is not the department's policy to publish details in regard to these weapons, it may be stated that a comparison of the characteristics of these torpedoes with those of the best torpedoes in service abroad indicates that the United States is at least abreast of all foreign countries in this respect. The service is, however, still lacking in numbers of torpedoes, and there is still much to be hoped for in the way of improvement in their handling on board ship, as the number of erratic runs and losses continues to be greater than can be contemplated with satisfaction. There has been a very marked improvement in this respect in the submarine and destroyer flotillas during the year, and it is hoped that a similar improvement will be noted in the battleship fleet.

There has been considerable improvement during the year in the rapidity of manufacture and supply of torpedoes by contractors, and

it is anticipated that during the ensuing year, with the funds provided by Congress, a considerable number of torpedoes can be added to the available supply.

The U. S. S. *Montgomery* and the U. S. S. *Vesuvius* have continued their experimental testing work on torpedoes, with very useful and satisfactory results, the *Montgomery* being employed as an experimental ship and the *Vesuvius* as an adjunct to the naval torpedo station. In this capacity the *Vesuvius* is not entirely satisfactory nor suited to the work, and to replace her a torpedo-testing barge is now under construction and will be placed in commission at the opening of the next firing season.

Work on torpedo tubes at the Naval Gun Factory has been carried on in a satisfactory manner, and all tubes required for vessels under construction are either completed or in an advanced state.

The U. S. S. *San Francisco* has been fitted out with a complete war allowance of mines, and further quantities will be purchased as soon as Congress authorizes the necessary expenditure. Experiments are being conducted with several new types of mines, both foreign and domestic, with a view to being prepared to furnish such material of this class as the department's policy may require.

AEROPLANES.

The bureau has, during the year, done some experimental work at the Naval Gun Factory in connection with the mechanical features of aviation, cooperating in this matter with the Bureau of Navigation. Owing to the volume of more immediately necessary work, no considerable progress has been made in the development of ordnance for use against or from air craft. Foreign progress in this matter is being closely watched, and it is thought that at such time as the necessity for ordnance of this character becomes urgent the bureau will be in a position to manufacture suitable material.

ORDNANCE MATERIAL FOR OTHER SERVICES.

During the year practically all vessels of the Revenue-Cutter Service have been equipped with three-pounder or six-pounder guns of latest types, the ordnance being loaned by the Navy Department to the Revenue-Cutter Service for this purpose. The bureau has also cooperated with the Chief of the Revenue-Cutter Division in the Treasury Department in the matter of developing a system of gunnery training and target practice for that service.

On recommendation of the bureau, the department has approved a plan whereby all ordnance material to be used by the Marine Corps, with the exception of small arms, small-arms ammunition, and Infantry equipments, are to be supplied by this bureau, the material being furnished on requisition of post quartermasters and being invoiced to them in all respects as if it were being invoiced to vessels.

The department having previously designated the Marine Corps as the agency for handling material for advance bases, the bureau has during the past year, with the department's approval, undertaken to furnish the necessary material to the Marine Corps under the same conditions as are prescribed for furnishing other ordnance material. It is the intention of the bureau to utilize ordnance material on hand

so far as possible for this purpose and to allot a small sum of money each year for the purpose of purchasing new and improved material.

EXPERIMENTAL WORK.

In compliance with the wishes of the Committee on Naval Affairs, House of Representatives, the bureau is preparing to carry out exhaustive experiments with armor-piercing projectiles and with relatively thin-walled projectiles carrying a large charge of high explosive. Special target structures will be built on Experimental Target A (late the *Katahdin*), and it is expected that all preparations will have been completed by the 1st of December, so that the firing can take place shortly after that date.

Coincidently with the preparations for the actual firing experiments at a target, experimental work will be conducted at the proving ground with several types of explosives to determine their sensitiveness, keeping qualities, and effectiveness of explosion. Owing to the very limited facilities of the proving ground as an experimental station and to the danger to life and private property which would attend the explosion of a large shell and possible bursting of guns, the experiments referred to can not be carried out at that station to the extent which would be desirable.

The subject of the flight of projectiles and their action in the air has been investigated and a large amount of data gathered and compiled, all of which tend to confirm the statements made in the last annual report regarding the direction of the axis of a projectile in flight.

NAVAL GUN FACTORY.

The increased volume of work done during the past year, combined with changes in administrative and shop methods and with improvement in facilities for work, has rendered the cost of work less than during any preceding year. The subject of modern management has been given very careful attention with respect to possible application to the Gun Factory of the methods advocated by efficiency engineers. Certain features of the system have been introduced and the bureau is pleased to report that, so far as it is aware, every change made has been acceptable to the employees, so that a real increase in efficiency has been secured without antagonizing labor and without introducing any features into the administration or work which are detrimental to the interests of the workmen.

An enormous amount of drafting and design work is imposed on the drafting force at the Naval Gun Factory owing to the rapid development of ordnance and the constant improvements in details that are being made. It has been found possible to increase the force slightly during the past year, but its size is such that much important work must be deferred or omitted altogether in order that current work may be kept up to date.

The volume of work thrown upon the employees of the chemical and physical laboratory is very great and their progress with the work of the Gun Factory is frequently retarded owing to the large number of coal and other analyses made for other bureaus. New and improved apparatus has been installed during the year, including an electric furnace with measuring instruments and a micro-photographic apparatus for the examination of steel and other metals.

The following is a tabulated summary of the most important work performed at the Gun Factory during the year:

Guns, all calibers.

Completed	100
Partly completed	175
Rebuilding	23
Lined	29
Converted to later models	12
Total	339

Breech mechanisms.

Completed, service type	154
Completed, experimental	3
Converted	115
Total	272

Miscellaneous.

Gun mounts, entire or major portions thereof, built, rebuilt, or extensively modified	261
Turret ammunition hoists	36
Gun sights	289
Drill guns	20
Bore sights	84
Torpedo tubes	31
Powder tanks	8,050
Cartridge cases	16,751
Chests and boxes for ammunition and for smokeless powder	39,841
Primers	79,260
Castings produced in foundry—pounds	3,287,987
Forgings—do	1,398,128
Number of shipments made	1,806
Total weight of shipments—pounds	15,522,494
Number of guns shipped	257
Expenditures, labor and material	$5,690,644.67
Total value of finished work	$6,399,787.33

Construction work on the new foundry, for which money was appropriated by Congress, has been begun and other improvements and additions are in hand which will add to the efficiency and reduce the cost of work at this establishment.

NAVAL PROVING GROUND.

The volume of work performed at this station has been greater during the past year than during any previous year in its history. This has been accomplished without any increase in the force of officers or classified employees and without materially increased expenditures owing to the improvements in equipment and methods which have been effected.

The following are the principal items of proof work completed:

Guns proved	222
Mounts proved	31
Armor plates tested	84
Lots of projectiles tested	208
Lots of cartridge cases tested	51
Powder tests	126

Among the most interesting and instructive items of experimental work are the following:

Tests of magazine extension primers.
Tests of different types of firing circuit.
Tests of detonating fuses.
Tests of new types of breech mechanism.
Tests of 14-inch gun mounts.
Tests of 1-pounder balloon gun.
Tests to determine the relative merits of series and parallel firing circuits.
Tests of different types of projectile band.
Firing at decapping armor plate.
Exploding shell in a tank of gasoline.

Experiments in the use of obsolete brown powder for fertilizing purposes have been carried on, and the material has been found suitable for this purpose; small quantities of it have been issued to other naval stations.

The addition of two telephone lines between Washington and Indian Head has made it possible to carry on business much more expeditiously, and the acquisition of the former torpedo boat *Talbot* as a passenger ferry between the Washington Navy Yard and the proving ground has facilitated transportation of mail and passengers and has to a marked extent overcome the isolation of the proving ground, which is a serious handicap to the contentment of persons living there.

No accidents resulting in loss of life have occurred at the proving ground or powder factory during the year; there have been 35 cases of minor accidents to employees.

POWDER FACTORY.

The output of this plant for the past year was about one and one-half million pounds of new powder and about 970,000 pounds of reworked powder. The amount of new powder manufactured was about 50 per cent greater and that of reworked powder about 28 per cent greater than for the preceding year. The production costs of new and of reworked powder have been reduced about 10 per cent in each case owing partly to the increased output and partly to improvements in machinery and methods; this reduction was accomplished in spite of advances in price of sulphur, sodium nitrate, and cotton.

* * * * * * *

NAVAL TORPEDO STATION.

The amount of torpedo repair work which must be performed at this station is constantly on the increase owing to the increased activity of the fleet in torpedo practice. This work is of a type distinct from the manufacturing work and the experimental work performed at the torpedo station, so that the station now serves in a triple capacity—those of an experimental station, a torpedo repair station, and a torpedo factory. During the year there have been received from the service for repair 170 torpedoes, and 161 torpedoes have been issued to vessels aside from the original outfits. Nineteen new outfits have been issued to battleships and torpedo vessels.

The work of manufacture of torpedoes has been carried on in a satisfactory manner, and while no completed torpedoes have been issued during the year, a lot of 75 new torpedoes and the work of rebuilding a lot of 90 old torpedoes will be completed in a few months,

and thereafter it is expected that about 90 torpedoes can be completed each year.

The material facilities at the torpedo station for the manufacture and repair of torpedoes are inadequate to the work imposed on the station. Some of the buildings are old and are not only unsuited for modern shop purposes, but they are in some cases structurally weak. Some details of the manufacture are carried on in an uneconomical and inefficient manner on account of lack of space and proper facilities. It is the bureau's desire, without increasing the capacity of the plant for manufacture beyond 100 torpedoes per year, to provide sufficient space to permit of this work being carried on contemporaneously with repair work, neither interfering with the other. The most urgent need of the torpedo station in this respect is floor space for assembling work, and the new building for which the present need is the greatest is the new assembly shop, the work proper to such a shop now being so scattered about the plant as to be done under great difficulties and with loss of economy and efficiency. Estimates will be submitted from time to time for such new buildings as may be necessary to this end.

In addition to torpedo work this station is engaged in the manufacture of primers and has, during the past year, manufactured 105,000. A considerable amount of work has also been done on spare parts and accessories for torpedoes and on mines.

The money value of articles manufactured at this station during the year was $426,472.87, which is practically 50 per cent in excess of the similar figure for the preceding year. Other expenditures at the station, including repairs to torpedoes, maintenance of the station, and miscellaneous expenditures amounted to $495,070.67, an increase of $240,000 as compared with the previous year. As judged by office records the volume of work at the station was about 25 per cent greater than in the previous year. The total weight of stores received and shipped during the year, as shown by bills of lading, was 2,760,238 pounds, an increase of nearly 1,000,000 pounds over the previous year.

The broad principles of modern management have been carefully studied at the torpedo station, and have been applied to such extent as they seemed applicable to conditions there existing. The result of an intelligent study and application of these principles is evident in the increased volume of work that has been done without involving increased cost. At the same time improvements have been made in the general layout of the plant and additional facilities in the way of buildings and tools have been provided, which have permitted of work being done in a more efficient, expeditious, and economical manner. As an example of the economies effected, it may be stated that two types of primers have been manufactured at a reduction of 20 per cent in the cost of labor alone.

A new ferryboat and a steam lighter are urgently needed at this station for the promotion of its efficiency and for reduction in cost of transporting employees and stores.

The seamen gunners' school has received 167 new men for instruction during the year, of whom 92 successfully finished the course and have been transferred to the general service. Sixty-nine remain at the station and will be graduated in two classes on August 31 and December 31, respectively.

The classes of this school at present are not as large as they should be for the maximum benefit to the service. The bureau has been impressed in past years with the lack of capacity of the school and, realizing the prime importance of a properly instructed personnel and the necessity of a properly equipped school for this instruction, has, during the past year, at a sacrifice of some storage space, provided a school building and has provided the necessary equipment. It is gratifying to note that the enlisted men detailed for this instruction have responded to the bureau's action and have, by their application to their studies, shown that they appreciated the added facilities placed at their disposal.

* * * * * * *

PRIVATE MANUFACTURING ESTABLISHMENTS.

Inspectors of ordnance have been stationed at numerous private manufacturing establishments, including shipyards and steel works. A great variety of material has been furnished by these establishments and the quality has been up to the usual standards.

The bureau is particularly pleased to be able to report an improvement in the matter of promptness in filling contracts. Serious delays in this respect are now of much less frequent occurrence than formerly. This change is undoubtedly due in part to the increased familiarity of the contractors with the Government requirements and is partly due to the continued insistence of the department on exact compliance with the terms of the contract and refusal to remit penalties or to grant delays unless such action is clearly just and equitable.

N. C. TWINING.

REPORT OF THE CHIEF OF THE BUREAU OF CONSTRUCTION AND REPAIR.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
Washington, D. C., October 16, 1912.

1. I respectfully submit herewith the report of the bureau for the fiscal year ending June 30, 1912, together with estimates for appropriations required for the fiscal year ending June 30, 1914.

* * * * * * *

SHIPBUILDING WORK AT NAVY YARDS.

The new shipbuilding work now in progress or authorized at navy yards includes the construction of the battleship *New York* at the navy yard, New York, the construction of the collier *Jupiter* at the navy yard, Mare Island, and the construction of the river gunboats *Monocacy* and *Palos* at the navy yard, Mare Island. Further, the appropriation act for the naval service for the fiscal year ending June 30, 1913, approved August 22, 1912, authorized—

Two fuel ships to cost, exclusive of armor and armament, not to exceed $1,140,000 each, and which shall be built in navy yards, one to be built in a navy yard on the Pacific coast.

It is apparent, therefore, that for several years to come the navy yards New York and Mare Island—the only yards fully equipped for the construction of large vessels—will have shipbuilding work in addition to the ship repair work which is regularly assigned to them.

Battleship "Florida."—The U. S. S. *Florida* was brought to 100 per cent completion during the past fiscal year at the navy yard, New York. Her construction was authorized by the naval appropriation act approved May 3, 1908, and the constructional period was placed at 32 months from November 24, 1908.

Her keel was laid March 9, 1909; she was launched May 12, 1910. She was commissioned September 15, 1911, and left the navy yard October 30, 1911, completed except as regards her official trial, which was later carried out very successfully.

Battleship "New York."—The U. S. S. *New York* is now under construction at the navy yard, New York. Her construction in a navy yard was authorized by the naval appropriation act approved June 24, 1910, and the Secretary of the Navy designated the navy yard, New York, as the place of building.

When estimates of the cost of construction of this battleship were received in the department, it was found that they exceeded the limit of cost imposed by Congress in the naval appropriation act, and in accordance with an opinion of the Attorney General, the Secretary of the Navy suspended all work on the vessel. The Secretary of the Navy reported the fact to Congress and the naval appropriation act of March 4, 1911, contained the following provision:

* * * and the limit of cost, exclusive of armor and armament, of the battleship authorized and directed by the naval appropriation act approved June 24, 1910, to be constructed in one of the navy yards, is hereby increased to $6,400,000, exclusive of indirect charges.

Upon the passage of the act the work of preparation for building the vessel was immediately resumed.

The naval appropriation act of March 4, 1911, contained also the following provision:

Provided, That no part of any sum herein appropriated shall be expended for the purchase of structural steel, ship plates, armor, armament, or machinery from any persons, firms, or corporations who have combined or conspired to monopolize the interstate or foreign commerce or trade of the United States, or the commerce or trade between the States and any Territory or the District of Columbia in any of the articles aforesaid, and no purchase of structural steel, ship plates, or machinery shall be made at a price in excess of a reasonable profit above the actual cost of manufacture.

and the placing of contracts for the material of the *New York* was again delayed pending an opinion by the Attorney General as to the steps necessary to insure compliance with the above provision. The necessary procedure having been determined, contracts for material were placed, and the keel of the *New York* was laid September 11, 1911. By decision of the department the constructional period of 36 months is considered as beginning May 1, 1911.

This vessel was launched October 30, 1912. On November 1, 1912, the hull of the *New York* was reported as 62.5 per cent completed and the machinery as 47 per cent completed. Her completion within the constructional period set by the department is anticipated.

Collier "Jupiter."—The circumstances relating to the construction of this fleet collier at the navy yard, Mare Island, are as follows:

The act making appropriations for the naval service for the fiscal year ending June 30, 1909 (approved May 13, 1908), contained the following provision:

Two fleet colliers of 14 knots trial speed, when carrying not less than 12,500 tons of cargo and bunker coal. One of said colliers to be built in such Government yard on

the Pacific coast as the Secretary of the Navy shall direct. Cost not to exceed $1,800,000 each, and toward the construction of both $1,500,000 is hereby appropriated.

Shortly after the passage of the above-noted appropriation bill the department advertised for proposals from private shipbuilding firms for the construction of one of these colliers by contract. On account of the great scarcity of work in shipyards at the time of inviting proposals for the construction of this collier, the bids received were unusually low, and the department was able to place a contract for the construction of this vessel at a price less than half of the limit of cost authorized by Congress for said construction. The department therefore determined to bring this fact to the attention of Congress, and to request authority to place contracts for four colliers at a total price not exceeding that already authorized for the construction of the two colliers specified in the naval appropriation bill of May 13, 1908. A recommendation to this effect from the Secretary of the Navy received the favorable consideration of the Naval Committee of the House, and a clause practically embodying the department's recommendation was incorporated in the naval appropriation bill as reported to the House. The naval committee's clause relating to the construction of colliers was, however, considerably modified before the bill actually passed the House, and was still further modified in the bill as it finally passed the House and the Senate, the act of March 3, 1909, containing the following provision for colliers, under the general heading "Increase of the Navy."

One fleet collier of 14 knots trial speed when carrying not less than 12,500 tons of cargo and bunker coal, to cost not exceeding $900,000.

* * * * * * *

Provided, That no part of the above appropriation shall be used for the payment of the construction of any collier the total cost of which shall exceed $900,000.

Shortly after the passage of the naval act of March 3, 1909, the bureau, under the authority of the department, directed that there be made at the navy yard, Mare Island, careful estimates of the cost of constructing at that yard the hull and machinery of a collier such as that authorized in the naval acts of May 13, 1908, and March 3, 1909. These estimates when submitted showed conclusively that the collier could not be built within the limit of cost fixed by Congress in the act of March 3, 1909, and the department decided to report all the facts to Congress before taking any further steps.

The naval appropriation bill, approved June 24, 1910, contained the following provisions:

* * * *Provided*, That the unexpended balance of the sum of $1,500,000 appropriated toward the construction of two fleets colliers authorized by the naval appropriation act approved May 13, 1908 is hereby reappropriated and made available for the construction of the collier therein designated to be built on the Pacific coast in such Government yard as the Secretary of the Navy shall direct: *Provided further*, That the cost of said collier shall not exceed the sum of $1,000,000.

The previous estimates of the cost of construction of this collier at the navy yard, Mare Island, exceeded the above-noted limit of cost imposed by Congress; but in order that the estimates should be brought up to date, additional estimates were requested from that navy yard. The estimate of cost of construction of this collier when received from the navy yard, Mare Island, indicated clearly that this collier could not be built at a navy yard within the limit of cost imposed by Congress, namely, $1,000,000.

The facts were again reported to Congress, and the naval appropriation bill approved March 4, 1911, contained the following express provision, which met the estimates for cost of construction received from the Mare Island yard:

Provided, That the limit of cost of the collier authorized and directed by the naval appropriation act, approved May 13, 1908, to be built in such Government yard on the Pacific coast as the Secretary of the Navy shall direct, is hereby increased from the modified $1,000,000 limit of cost imposed by the act of June 24, 1910, to $1,200,000, exclusive of indirect charges.

In accordance therewith, the Mare Island yard was directed to proceed with the construction of the vessel; and upon determination of the type of propelling machinery the constructional period was fixed at 22 months from July 3, 1911.

The keel of the *Jupiter* was laid October 18, 1911, and the vessel was successfully launched August 24, 1912. On November 1, 1912, the hull of the *Jupiter* was reported as 85.6 per cent completed, including 2.9 per cent material on hand, and 83.7 per cent work on ship and in shops. The machinery was reported as 56.8 per cent completed.

River gunboat "Monocacy."—The U. S. S. *Monocacy* was authorized by act of Congress of March 4, 1911. Bids were invited for her construction, in the usual manner, and four navy yards were asked to submit estimates. Only one bid was received from a private shipbuilding company, and that practically at the limit of cost imposed by Congress. As the estimates received from navy yards were materially less than the one bid received, the Bureau of Construction and Repair and the Bureau of Steam Engineering jointly recommended to the department that the construction be undertaken at Mare Island Navy Yard. The Secretary of the Navy ordered Mare Island to proceed with the construction of this vessel on August 13, 1912.

River gunboat "Palos."—The naval appropriation act of August 22, 1912, made available for the construction of a river gunboat the appropriation contained in the act of May 4, 1898, for one gunboat to be built on the Great Lakes.

In view of the department's experience in obtaining bids for the construction of the *Monocacy*, the improbability of obtaining bids at the time to the advantage of the Government, the existing demands for river gunboats on the China station, and the time saved in starting the work, the department on August 23, 1912, ordered that this vessel be constructed at the navy yard, Mare Island, simultaneously with the building of the *Monocacy*.

THE EIGHT-HOUR LAW

The three battleships *Texas*, *Nevada*, and *Oklahoma* at present under contract are building under the eight-hour law. The average price per ton of normal displacement of the three vessels in question, building under the eight-hour law, is $215.26. The average price of the preceding battleships built by contract when the hours of labor were unrestricted was $177.25 per ton of normal displacement for the three preceding and $189.99 per ton for the five preceding vessels. The appropriation act approved August 22, 1912, applies the

eight-hour law to all new construction authorized therein by the following language:

The act entitled "An act limiting the hours of daily service of laborers and mechanics employed upon work done for the United States, or for any Territory or for the District of Columbia, and for other purposes," approved June 19, 1912, shall be in force as to all contracts authorized by this act from and after the passage of this act.

RAPIDITY OF CONSTRUCTION.

The annual report of the Chief of the Bureau of Construction and Repair for 1910 compared the rapidity of battleship construction in this and foreign countries, and demonstrated by tables that "the rapidity of construction in the United States is greater than the average rate of construction in the principal foreign ship-building countries."

Notwithstanding the recent marked increase in sizes of vessels, the time required for construction remains practically unchanged, and the rapidity of construction in the United States, both for battleships and destroyers recently completed without restriction as to hours of labor, continues greater than the average rate of construction in the principal foreign shipbuilding countries. The effect of the eight-hour law upon rapidity of construction is as yet indeterminate.

* * * * * * *

INSPECTION OF MATERIAL.

The total quantity of material inspected by the bureau and the amount passed and shipped for incorporation into naval vessels under construction or repair shows an increase over the preceding year. The total quantity submitted for inspection during the fiscal year ending June 30, 1912, was 121,920,658 pounds, as compared with a total of about 77,504,700 pounds for the fiscal year ending June 30, 1911. The distribution of this material among the several districts into which the inspection work is divided, as well as the quantities rejected for various causes, percentage of rejection, etc., are given in the tables below:

Summary of work performed by steel inspectors under the Bureau of Construction and Repair for the eastern and western districts during the fiscal year ending June 30, 1912.

	Eastern district.	Western district.	Total.
Total amount of material rolled and inspected.....pounds..	61,439,305	60,481,353	121,920,658
Amount rejected for physical tests.....do....	5,233,852	1,755,694	6,989,546
Percentage rejected for physical tests.....	8.52	2.90	5.74
Amount rejected for chemical tests.....pounds..	1,097,182	113,253	1,210,435
Percentage rejected for chemical tests.....	1.79	.187	.99
Amount rejected for surface defects.....pounds..	2,588,353	10,460,184	13,048,537
Percentage rejected for surface defects.....	4.21	17.29	10.70
Amount rejected for all causes.....pounds..	8,919,387	12,329,131	21,248,518
Percentage rejected for all causes.....	14.51	20.38	17.43
Scrap.....	17,236,412	9,472,617	26,709,029
Total amount of material accepted and shipped.....	35,283,506	38,679,605	73,963,111

The following table shows the distribution of material among vessels building, etc.:

Detail statement of shipment of material from the eastern and western districts for the fiscal year ending June 30, 1912.

Name of vessel, etc.	Eastern district.	Western district.	Total.
	Pounds.	*Pounds.*	*Pounds.*
Arkansas	399,480	267,484	666,964
Aylwin	622,116	104,046	726,162
Balch	615,361	104,046	719,407
Beale	36,432	.....	36,432
Benham	616,844	104,046	720,890
Cassin	61,111	597,387	658,498
Culgoa	5,084	.....	5,084
Cummings	57,836	625,682	683,518
Downes	557,219	35,903	593,122
Duncan	18,768	729,190	747,958
Fanning	96,862	11,552	108,414
Henley	38,939	3,545	42,484
Jarvis	79,446	4,135	83,581
Jenkins	41,040	13,219	54,259
Jouett	38,712	13,219	51,931
Monaghan	50	.....	50
Nereus	2,923,709	1,251,677	4,175,386
Nevada	93,890	2,728,160	2,822,050
New York	11,819,217	6,536,619	18,355,836
Oklahoma	362,555	5,200,357	5,562,912
Parker	616,793	104,046	720,839
Patterson	148	.....	148
Proteus	2,909,407	1,161,172	4,070,579
Texas	1,644,682	7,617,258	9,261,940
Turbot	5,901	.....	5,901
Utah	15,611	100	15,711
Warrington	18,785	.....	18,785
Wyoming	497,051	74,859	571,910
G-2	402	.....	402
G-3	19,038	95,162	114,200
G-4	1,153	.....	1,153
H-1	1,693	13,554	15,247
H-2	463	13,554	14,017
H-3	463	13,502	13,965
K-1	10,388	427,326	437,714
K-2	769	387,516	388,285
K-3	39,460	349,964	389,424
K-4	39,459	377,165	416,624
K-5	574	423,237	423,811
K-6	422	430,756	431,178
K-7	.....	341,169	341,169
K-8	.....	381,719	381,719
Contracts and requisitions	10,976,173	8,137,279	19,113,452
Total	35,283,506	38,679,605	73,963,111

* * * * * * *

LIST OF VESSELS OF THE UNITED STATES NAVY.

The list of vessels heretofore published as a part of this report has been omitted. The information is now published by the department in a special pamphlet, "Ships' Data, United States Naval Vessels."

ADDITIONS TO THE NAVY SINCE JUNE 30, 1911.

The additions to the effective force of the Navy by the completion of vessels building under contract and at navy yards are as follows: Battleships *Arkansas, Florida, Utah, Wyoming;* torpedo-boat destroyers *Mayrant, Walke, Patterson, Jouett, Fanning, Jenkins, Beale, Jarvis;* submarine torpedo boats *E-1, E-2, F-1, F-2, F-3, G-1;* colliers *Orion, Neptune;* tugs *Ontario, Sonoma.*

Statement of data relative to trials and acceptances of vessels which have been preliminarily accepted and those finally accepted since the last annual report.

Name.	Type.	Date of trial.	Speed required by contract.	Speed obtained on trial.	Date of preliminary acceptance.	Date of final acceptance.	By whom built.
		1912.	*Knots.*	*Knots.*	1912.		
Arkansas	Battleship	June 4	20.5	21.03	Sept. 14	.....	New York Shipbuilding Co.
		1909.			1910.	1911.	
Delaware	do	Oct. 23	21	21.56	Feb. 15	Oct. 27	Newport News Co.
		1912.			[1]1911.		
Florida	do	Mar. 25	20.75	22.08	Sept. 15	.....	Government.
		1906.			1907.		
Nebraska	do	July 17	19	19.06	May 31	.....	Moran Bros. Co.
		1909.			1910.		
North Dakota	do	Nov. 5	21	21.01	Apr. 11	Nov. 11	Fore River Co.
		1911.			1911.		
Utah	do	July 2	20.75	21.04	Aug. 30	.....	New York Shipbuilding Co.
		1912.			1912.		
Wyoming	do	July 19 to 22	20.5	21.22	Sept. 23	.....	Wm. Cramp & Sons.
		1911.			1911.	1912.	
mmen	Torpedo-boat destroyer.	Apr. 7	29.5	30.48	May 20	July 29	New York Shipbuilding Co.
		1912.			1912.		
Beale	do	June 25	29.5	29.65	Aug. 29	.....	Wm. Cramp & Sons.
		1911.			1911.		
Burrows	do	Jan. 8	29.5	30.67	Feb. 17	Aug. 8	New York Shipbuilding Co.
		1910.			1910.		
Drayton	do	Oct. 14	29.5	30.83	Oct. 29	.....	Bath Iron Works.
		1912.			1912.		
Fanning	do	May 28	29.5	29.99	June 20	.....	Newport News Shipbuilding Co.
Jenkins	do	May 21	29.5	31.27	June 14	.....	Bath Iron Works.
Jouett	do	Apr. 30 to May 1	29.5	32.27	May 24	.....	Do.
		1910.			1911.		
Mayrant	do	May 17	30	30.22	July 10	Aug. 14	Wm. Cramp & Sons.
McCall	do	Dec. 9	29.5	30.66	Jan. 18	July 29	New York Shipbuilding Co.
		1911.					
Monaghan	do	May 27	29.5	30.45	June 20	Mar. 16	Newport News Co.
		1910.			1910.		
Paulding	do	Sept. 2	29.5	32.80	Sept. 27	.....	Bath Iron Works.
		1911.			1911.		
Patterson	do	Aug. 11	29.5	29.68	Oct. 7	June 7	Wm. Cramp & Sons.
		1910.			1910.		
Perkins	do	Sept. 30	29.5	29.76	Nov. 15	.....	Fore River Co.
						1912.	
Roe	do	July 16	29.5	29.60	Sept. 15	June 19	Newport News Co.
		1909.			1909.	1911.	
Smith	do	Sept. 23	28	28.35	Nov. 24	Nov. 18	Wm. Cramp & Sons.
		1910.			1910.		
Sterett	do	Nov. 6	29.5	30.37	Dec. 12	.....	Fore River Co.
Terry	do	Sept. 24	29.5	30.24	Oct. 12	.....	Newport News Co.
		1911.			1911.	1912.	
Trippe	do	Feb. 21	29.5	30.89	Mar. 21	.....	Bath Iron Works.
Walke	do	Apr. 24	29.5	29.78	July 18	.....	Fore River Co.
Warrington	do	Jan. 12	30	30.12	Mar. 17	Jan. 20	Wm. Cramp & Sons
					1912.		
Jarvis	do	.....	29.5	.....	Oct. 21	.....	New York Shipbuilding Co.
		1910.			1910.		
D-3	Submarine	June 9 to 18.	.....	.....	Sept. 1	Feb. 15	Fore River Co.

[1] Date of commission.

Statement of data relative to trials and acceptances of vessels—Continued.

Name.	Type.	Date of trial.	Speed required by contract.	Speed obtained on trial.	Date of preliminary acceptance.	Date of final acceptance.	By whom built.
		1911.	*Knots.*	*Knots.*	1912.		
E-1	Submarine	Nov. 15 to 22. Dec. 12 to 15.			Feb. 14		Fore River Co.
E-2	do	Nov. 14 to 23. Dec. 11 to 15.			Feb. 14		Do.
		1912.					
F-1	do	Apr. 5 to May 3.			June 19		Union Iron Works.
F-2	do	May 6 to 23.			June 25		Do.
F-3	do	June 17 to July 10			Aug. 5		Seattle Con. & D. D. Co.
		1912.					
G-1	do	Sept. 3			Oct. 18		Newport News Co.
		1910.			1910.	1912.	
Cyclops	Collier	Oct. 26 to 28.	14	14.61	Nov. 8	Mar. 9	Wm. Cramp & Sons.
		1911.					
Neptune	do	July 27 to 29.	14	12.93			Maryland Steel Co.
		1912.			1912.		
Orion	do	July 9	14		July 24		Do.
Ontario	Tug	Aug. 12 to 17.	14	13.23	Sept. 3		New York Shipbuilding Co.
Sonoma	do	Aug. 12 to 17.	14	13.08	Sept. 5		Do.

Vessels dropped from the Navy since June 30, 1911.

Name.	Type.	Status.	Stricken from the Navy Register—Disposition.	Appraised value.
San Marcos	Second-class battleship.	Regular Navy.	Oct. 11, 1911[1]	
Hist	Converted yacht	do	July 27, 1911	[2]$2,421
Alliance	Wooden sailing vessel.	do	Aug. 9, 1911	[2]2,300
Pensacola	Receiving ship	do	Dec. 23, 1911	[2]12,025
Locust	Tug	do	Jan. 6, 1912	[2]3,184
Atlanta	Cruiser	do	Apr. 24, 1912	[2]21,200
Yosemite		do	Feb. 14, 1912	[2]11,655
Erricsson	Torpedo boat	do	Apr. 6, 1912	1,200
Cushing	do	do	do	1,500
McKee	do	do	do	700
Yankee	Cruiser	do	Apr. 17, 1912	[2]2,010
Isla De Cuba	Gunboat	do	May 17, 1912	
Alvarado	do	do	May 20, 1912	[2]851
Talbot	Torpedo boat	do	May 1, 1912	
Jamestown	Wooden sailing vessel.	do	Sept. 4, 1912	2,500
Rowan	Torpedo boat	do	Oct. 29, 1912	
Porter	Torpedo boat	do	Nov. 7, 1912	

[1] Hulk to be retained for Government use.

[2] Selling price.

Vessels building for the increase of the Navy are listed in the following tables, which include all those authorized by law, with the exception of 1 battleship, 1 destroyer tender, 1 submarine tender, 2 fleet oilers, 6 torpedo-boat destroyers, and 8 submarine boats appropriated for by the last Congress.

Vessels building under contract.

Name.	By whom building.	Estimate of—		Contract time.	Expiration of contract time.
		Degree of completion Nov. 1, 1912.	Probable date of completion.		
BATTLESHIPS.		*Per cent.*		*Months.*	
Texas	Newport News Shipbuilding Co.	79.2	Sept. 5, 1913	36	Dec. 17, 1913
Nevada	Fore River Shipbuilding Co.	10.1	Apr. 22, 1915	36	Jan. 22, 1915
Oklahoma	New York Shipbuilding Co.	9.3	do	36	Do.
GUNBOAT.					
Sacramento	Wm. Cramp & Sons	0.0		21	June 9, 1914
TORPEDO-BOAT DESTROYERS.					
Henley	Fore River Shipbuilding Co.	96.9	Oct. 4, 1912	24	Nov. 28, 1912
Cassin	Bath Iron Works	60.4	June 21, 1913	24	Sept. 6, 1913
Cummings	do	52.7	Aug. 24, 1913	24	Do.
Downes	New York Shipbuilding Co.	25.0	Dec. 29, 1913	24	Sept. 8, 1913
Duncan	Fore River Shipbuilding Co.	44.4	Oct. 3, 1913	24	Sept. 6, 1913
Aylwin	Wm. Cramp & Sons	61.3	July 16, 1913	22½	July 22, 1913
Parker	do	56.6	Aug. 22, 1913	23	Aug. 7, 1913
Benham	do	56.0	Sept. 13, 1913	23½	Aug. 22, 1913
Balch	do	58.6	Oct. 1, 1913	24	Sept. 7, 1913
SUBMARINE TORPEDO BOATS.					
F-4	The Moran Co.	94.6	Nov. 17, 1912	29	Aug. 5, 1911
G-4	Wm. Cramp & Sons	88.3	May 9, 1913	30	Oct. 24, 1911
G-2	Newport News Shipbuilding Co.	86.0	July 28, 1913	28	Aug. 21, 1911
H-1	Union Iron Works	84.5	Feb. 19, 1913	29	Jan. 10, 1913
H-2	do	84.5	Feb. 23, 1913	29	Do.
H-3	The Moran Co.	82.1	Feb. 28, 1913	30	Feb. 10, 1913
G-3	Lake Torpedo Boat Co.	60.0	May 28, 1913	20	Sept. 19, 1912
K-1	Fore River Shipbuilding Co.	54.2	Sept. 15, 1913	25	June 30, 1913
K-2	do	53.5	Sept. 21, 1913	25	Do.
K-3	Union Iron Works	59.0	July 30, 1913	26	July 30, 1913
K-4	The Moran Co.	54.5	Dec. 3, 1913	27	Aug. 30, 1913
K-5	Fore River Shipbuilding Co.	38.6	Dec. 27, 1913	24	Oct. 27, 1913
K-6	do	38.1	Feb. 3, 1914	25	Nov. 27, 1913
K-7	Union Iron Works	42.0	Dec. 27, 1913	26	Dec. 27, 1913
K-8	do	41.5	Jan. 27, 1914	27	Jan. 27, 1914
COLLIERS.					
Proteus	Newport News Shipbuilding Co.	72.0	July 23, 1913	22	June 29, 1913
Nereus	do	62.5	Aug. 20, 1913	22	Do.
Jason	Maryland Steel Co.	66.7	July 10, 1913	24	Aug. 22, 1913
SUBMARINE TENDER.					
Niagara	New London Ship & Engine Co.	0.0	June 19, 1914	24	June 19, 1914

Vessels building at navy yards.

Name.	Where building.	Estimate of—		Constructional period.	Expiration of constructional period
		Degree of completion Nov. 1, 1912.	Probable date of completion.		
BATTLESHIPS.					
		Per cent.		*Months.*	
New York	Navy yard, New York, N. Y.	62.5	May 1, 1914	36	May 1, 1914
GUNBOATS.					
Monocacy	Navy yard, Mare Island, Cal.	0.7			
Palos	do	0.7			
COLLIER.					
Jupiter	Navy yard, Mare Island, Cal.	85.6	May 3, 1913		May 3, 1913

VESSELS LAUNCHED SINCE JUNE 30, 1911.

The following is a list of vessels launched since June 30, 1911, together with the date of launching:

Name.	Launched.	Name.	Launched.
F-1	Sept. 6, 1911	Jouett	Apr. 15, 1912
Fanning	Jan. 11, 1912	Sonoma	May 11, 1912
G-2	Jan. 10, 1912	Texas	May 18, 1912
F-3	Jan. 6, 1912	Beale	Apr. 30, 1912
F-4	do	Jenkins	Apr. 29, 1912
F-2	Mar. 19, 1912	G-4	Aug. 15, 1912
Orion	Mar. 23, 1912	Jupiter	Aug. 24, 1912
Ontario	Apr. 11, 1912	Proteus	Sept. 14, 1912
Jarvis	Apr. 3, 1912	New York	Oct. 30, 1912
Henley	Apr. 3, 1912		

NEW VESSELS AUTHORIZED.

BATTLESHIPS.

The plans and specifications for first-class battleships No. 36, *Nevada*, and No. 37, *Oklahoma*, authorized by act of Congress approved March 4, 1911, were completed and circular signed by the Secretary of the Navy, October 18, 1911, and issued to the bidders upon request after November 1, 1911.

The general dimensions and features of each vessel are as follows:

Length on designer's water line.....575 feet.
Breadth, extreme, at designer's water line.....95 feet 2⅜ inches.
Mean trial displacement.....27,500 tons.
Mean draft to bottom of keel at trial displacement (about).....28 feet 6 inches.
Total fuel-oil storage.....2,000 tons.
Fuel-oil carried on trial.....1,333 tons.
Feed water carried on trial.....165 tons.
Speed on trial, not less than.....20½ knots.

Armament:
Main battery—
Ten 14-inch 45-caliber breech-loading rifles.
Four submerged torpedo tubes.
Secondary battery—
Twenty-one 5-inch rapid-fire guns, 51 caliber.
Four 3-pounder saluting guns.
Two 1-pounder semiautomatic guns for boats.
Two 3-inch fieldpieces.
Two machine guns, .30 caliber.

Bids for the construction of battleships No. 36, *Nevada*, and No. 37, *Oklahoma*, were opened at the department January 4, 1912.

Proposals received for the construction of battleships No. 36, "Nevada," and No. 37, "Oklahoma."

Class 1: Hull and equipment and reciprocating machinery, department's plans. Class 2: Hull and equipment, department's plans; machinery, bidder's design.]

Bidder.	Class 1.	Class 2.	Magazine refrigeration.	Time.	Speed.	Type of propelling machinery.
				Months.	*Knots.*	
Fore River Shipbuilding Co.[1]	$5,980,000	.....	Yes.....	36	20.5	Twin screw, vertical inverted, 4-cylinder, triple engines.
Do.....	5,940,000	.....	No.....	36	20.5	Do.
Do.....	.....	$5,935,000	Yes.....	36	20.5	Twin screw, Curtis turbines.
Do.....	.....	5,895,000	No.....	36	20.5	Do.
Do.....	.....	5,955,000	Yes.....	36	20.5	Twin screw, Curtis turbines, with reciprocating engine on each shaft.
Do.....	.....	5,915,000	No.....	36	20.5	Do.
New York Shipbuilding Co.[2]	.....	5,926,000	No.....	36	20.5	Twin screw, vertical inverted, 4-cylinder, triple engines.
Do.....	.....	5,965,000	Yes.....	36	20.5	Do.
Newport News Ship & Dry Dock Co. (2 vessels).	6,450.000 (each).	.....	Yes.....	36	20.5	Twin screw, vertical inverted, 4-cylinder, triple engines.
Do.....	6,350.000 (each).	.....	Yes.....	36	20.5	Do.

[1] Nickel steel instead of S. T. S. for decks, flats, and bulkheads below splinter deck and bulkheads between splinter and protected decks. Entire splinter deck between frames 20 and 122 lower course 50-pound plating on middle protected deck between frames 20 and 122.
[2] Nickel steel substituted for 60 per cent of S. T. S. called for by department's design.

Contract for battleship No. 36, *Nevada*, was signed with the Fore River Shipbuilding Co., Quincy, Mass., on January 22, 1912, at a price of $5,895,000; to have the bidder's design of Curtis turbines installed, and to be completed within 36 months.

Contract for battleship No. 37, *Oklahoma*, was signed with the New York Shipbuilding Co., Camden, N. J., on January 22, 1912, at a price of $5,926,000; to have reciprocating engines installed, and to be completed within 36 months.

GUNBOAT NO. 19, "SACRAMENTO."

The plans and specifications for gunboat No. 19, *Sacramento*, authorized by act of Congress approved March 4, 1911, were completed and circular signed by the Secretary of the Navy November 27, 1911, and issued to bidders upon request thereafter.

Bids for the construction of gunboat No. 19, *Sacramento*, were opened at the department February 1, 1912.

The proposals received being in excess of the appropriation, a new circular was signed by the Secretary of the Navy April 18, 1912, and bids were opened at the department July 1, 1912.

The general characteristics of the vessel under contract are as follows:

Length between perpendiculars..... 210 feet.
Length over all..... 226 feet 2 inches.
Breadth molded..... 40 feet 9 inches.
Breadth extreme to outside of plating..... 40 feet 10⅜ inches
Depth at side, least, molded..... 25 feet 9 inches.
Mean trial displacement..... 1,425 tons.
Mean draft to bottom of keel at mean trial displacement, about.. 11 feet 5½ inches.
Speed on trial..... 12 knots.
Battery:
Three 4-inch rapid-fire guns.
Two 1-pounder guns (mounted on ship and for use in boats).
Two 30-caliber machine guns.
Two 3-inch field pieces.
Two 3-pounder guns for saluting.

Proposals received for the construction of gunboat No. 19, "Sacramento."

[Class 1: Hull and machinery, department's plans. Class 2: Hull and equipment department's plans; machinery, bidder's plans. Class 3: Hull, machinery, and equipment, bidder's design.]

Bidders.	Class 1.	Class 2.	Class 3.	Months to complete.	Speed.	Type of propelling machinery.
					Knots.	
Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, Pa.[1]	$716,500	.....	.....	21	16	Reciprocating.
	.....	[2]$485,000	.....	21	14	Do.
	.....	.....	$723,000	21	16	Do.
Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, Pa.[3]	499,500	.....	.....	21	12	Do.
	.....	492,500	.....	21	12½	Do.

[1] Bids received Feb. 1, 1912. [2] Alternate bid. [3] Bids received July 1, 1912.

Contract for gunboat No. 19, *Sacramento*, was signed with the Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, Pa., on September 9, 1912, at a price of $492,500; to have the bidder's design of reciprocating engines installed and to be completed within 21 months.

RIVER GUNBOAT "MONOCACY."

The plans and specifications for light-draft river gunboat *Monocacy*, authorized by act of Congress approved March 4, 1911, were completed and circular signed by the Acting Secretary of the Navy April 3, 1912, and issued to bidders upon request thereafter.

The general characteristics of the vessel are as follows:

Length between perpendiculars.....160 feet.
Breadth, molded, extreme.....24 feet 6 inches.
Depth at side, molded.....5 feet 9 inches.
Mean trial displacement, about.....190 tons.
Mean draft to bottom of keel at mean trial displacement.....2 feet 5 inches.
Speed (in deep water, 6 fathoms or more).....13¼ knots.
Battery:
Two 6-pounders.
Two 3-inch field pieces, with carriages and limbers.
Six .30-caliber machine rifles.

Bids for the construction of river gunboat *Monocacy* were opened at the department June 10, 1912.

Proposals received for the construction of river gunboat "Monocacy."

[Class 1: Hull and machinery, department's plans. Class 2: Hull and equipment, department's plans machinery, bidder's plans.]

Bidders.	Class 1.	Class 2.	Months to complete.	Speed.	Type of propelling machinery.
				Knots.	
Seattle Construction & Dry Dock Co., Seattle, Wash.	[1] $212,600 [2] 214,500 [3] 290,000	.....	18	13½	Reciprocating.

[1] F. o. b. cars works of contractor.
[2] F. o. b. trans-Pacific steamer San Francisco.
[3] Shanghai, China, reerected.

The department has directed that river gunboat *Monocacy* be built at the navy yard, Mare Island, Cal.

GUNBOAT NO. 16, "PALOS."

The appropriation made by the act of Congress approved May 4, 1898, for one gunboat to be built on the Great Lakes is made available by the act of Congress, August 22, 1912, for the construction of a river gunboat.

This vessel will be a duplicate of river gunboat *Monocacy* and will be built at the navy yard, Mare Island.

SUBMARINE TORPEDO BOATS.

Circular defining the chief characteristics of submarine torpedo boats *Nos. 36* to *39*, inclusive, authorized by act of Congress approved March 4, 1911, was signed by the Acting Secretary of the Navy June 21, 1911, and issued to bidders upon request thereafter.

Bids for the construction of these vessels were opened at the department September 1, 1911, and contracts were awarded as follows:

Contracts for submarines *Nos. 36* and *37* (K–5 and K–6) were signed with the Electric Boat Co., of New York, N. Y., on October 27, 1911, at a price of $478,000 each, to be completed within 24 months and 25 months, respectively.

Contracts for submarines *Nos. 38* and *39* (K–7 and K–8) were signed with the Electric Boat Co., of New York, N. Y., on October 27, 1911, at a price of $512,000 each, to be completed in 26 months and 27 months, respectively.

SUBMARINE TENDER NO. 1, "NIAGARA."

The plans and specifications for submarine tender No. 1, *Niagara*, authorized by act of Congress approved March 4, 1911, were completed and circular signed by the Assistant Secretary of the Navy December 18, 1911, and issued to bidders upon request thereafter.

Bids for the construction of submarine tender No. 1, *Niagara*, were opened at the department April 30, 1912.

Proposal received for the construction of submarine tender No. 1, "Niagara."

[Class 1, hull and equipment, department's plans, machinery, bidder's plans; Class 2, hull, machinery, and equipment, bidder's plans.]

Bidder.	Class 1.	Class 2.	Months to complete.	Speed.	Type of propelling machinery.
New London Ship & Engine Co.	.....	$494,000	24	*Knots.* 12¼	Internal combustion, 2 shafts (Diesel).

Contract for submarine tender No. 1, *Niagara*, was signed with the New London Ship & Engine Co., Groton, Conn., on June 19, 1912, at a modified price of $492,930.

The general dimensions are as follows:

Length over all.....226 feet 6 inches.
Depth molded to upper deck at center line at one-half length.....24 feet 3 inches.
Draft, trial load.....12 feet 11½ inches.
Length on load water line.....216 feet.
Beam, molded.....35 feet.
Mean trial displacement.....1,408 tons.

BATTLESHIPS, SUBMARINE TENDER, DESTROYER TENDER, FLEET OILERS, TORPEDO-BOAT DESTROYERS, AND SUBMARINES.

The plans and specifications for battleship No. 38, *Pennsylvania*, fleet oilers *Nos. 1* and *2*, destroyer tender *No. 1*, and submarine tender *No. 2*, and circular for submarines *Nos. 40* to *47*, authorized by act of Congress approved August 22, 1912, are in course of preparation.

The plans and specifications for torpedo-boat destroyers *Nos. 51* to *56* have been completed and issued to bidders. The circular for the construction of these vessels was signed by the Acting Secretary of the Navy August 24, 1912, and issued to bidders upon request thereafter. Bids will be opened November 18, 1912.

* * * * * * *

Respectfully,

R. M. Watt,
Chief Constructor United States Navy,
Chief of Bureau.

The Secretary of the Navy.

REPORT OF THE CHIEF OF THE BUREAU OF STEAM ENGINEERING.

Navy Department,
Bureau of Steam Engineering,
Washington, D. C., October 3, 1912.

* * * * * * *

During the year plans, specifications, and estimates have been completed and contracts let for the machinery for battleship *No. 36, Nevada*, and *No. 37, Oklahoma*, and torpedo-boat destroyers *Nos. 43* to *50*, inclusive, and for submarines of the K class, while similar work has been completed and the contracts about to be awarded for the gunboat *Sacramento* and the river gunboat *Monocacy*. A number of changes have been made tending to improve the machinery of vessels in the fleet, such as installation of forced lubrication, installation of

turbine-driven blowers in destroyers having reciprocating-driven blowers, alterations in propellers to give better speed, etc. Similar improvements will be extended to other vessels as opportunity presents.

The general overhaul of machinery plants of the battleships *Alabama*, *Illinois*, *Kearsarge*, *Kentucky*, and *Wisconsin* and of the protected cruisers *Chattanooga*, *Cleveland*, *Denver*, and *Galveston* were completed during the year, three of the battleships having been supplied with new boilers.

The alterations to the Niclausse boilers of the *Colorado* and *Pennsylvania*, which were outlined in the last annual report, have been completed, and after trial in service it is proposed to determine the best method of equipping these vessels with efficient boilers.

The electric machinery for the collier *Jupiter* is practically completed at the works of the General Electric Co., Schenectady, N. Y., and good progress has been made on that portion of the power equipment which is under construction at the Mare Island yard.

The machinery of the *Florida* has been completed at the New York Navy Yard, and the vessel is in service with the Atlantic Fleet. Her official trial demonstrated the excellent character of the workmanship on her machinery, her speed having exceeded that of the sister ship *Utah*, which was built by contract and from the same plans. The construction of this machinery has further demonstrated the fact that a well-equipped navy yard can build machinery at a cost that compares favorably with the cost of similar machinery built by contract.

The establishment of regular overhaul periods for the vessels of the fleet has done much to systematize work in the yards and to prevent accumulation of work at one period, followed by a period of depression, necessitating the discharge of a large number of men. As now arranged, it is possible to keep steadily employed a number of skilled workmen whose retention is desirable, and thus to increase their interest both in the quality and the quantity of work performed. The result is a satisfactory condition for the workmen as well as for the Government.

COAL TESTS.

Tests have been made to establish the relative efficiencies of coal stored for one year under water, under shed, and in the open at New London, Conn. There remains sufficient coal in these various storages to allow a continuation of annual tests extending over a period of 10 years, and it is proposed to carry out these tests so that positive and definite conclusions may be drawn on a question which in the past has been a matter more of speculation and opinion than of conclusive experimentation.

PACIFIC COAST COALS.

The tests of Washington State, Colorado, and British Columbia coals have continued; armored cruisers of the Pacific Fleet having made actual steaming tests with these coals. In addition to the board of naval officers formed to conduct these tests representatives of the Bureau of Mines, Department of the Interior, were on board and rendered valuable assistance.

RADIO TELEGRAPHY.

Since the introduction of high-frequency quenched gap radio apparatus the most urgent work of the department has been the modernizing of old installations. This work has been advanced during the past year as rapidly as limited funds and the slow deliveries of contractors have permitted. Much in this line remains to be accomplished, especially in the case of coastal stations, which as a result of pending legislation will be thrown open to commercial work. All new ships commissioned within the year have been provided with modern apparatus, but it has not been possible to properly equip the entire fleet because sufficient funds were not available.

With the assignment of two additional officers for the administration of this rapidly expanding branch it becomes possible for the first time to foresee a time when other and intrinsically more important features of this activity will be upon a satisfactory basis. These features relate to the development of radio for tactical purposes, experimentation in connection with purely naval needs, proper supervision and training of operators, and the standardization of material and operating methods.

The high-power station at Arlington is rapidly approaching completion.

ELECTRICAL.

The operations of the electrical division of the bureau during the year have been extensive. Specifications covering the electrical work on the battleships *Nevada* and *Oklahoma* and other craft authorized by recent legislation have been formulated. Plans for light, power, and interior communication for new battleships *Texas*, *New York*, *Oklahoma*, *Nevada*, for gunboats, and for destroyers *Nos. 43* to *50*, inclusive, have been prepared. Fixtures have been simplified and made cheaper and more durable.

The electrical control of searchlights has been redesigned and a new mechanical control developed. It is hoped that the improvements made will result in a perfectly satisfactory light for naval purposes.

The entire subject of illumination has been thoroughly investigated, and the new ships will be a great improvement over present practice in this respect.

CONDITION OF MACHINERY OF VESSELS CONSTRUCTED OR UNDER CONSTRUCTION AT PRIVATE SHIPYARDS, JULY 1, 1912.

The following vessels have been tried during the year:

	Knots.
Torpedo-boat destroyer No. 36, *Patterson* (Wm. Cramp & Sons):	
Speed on standardization trial (average of 5 highest runs)	31.918
Speed on 4-hour full-speed trial	29.685
Torpedo-boat destroyer No. 37, *Fanning* (Newport News Shipbuilding & Dry Dock Co.):	
Speed on standardization trial (average of 5 highest runs)	30.814
Speed on 4-hour full-speed trial	29.994
Torpedo-boat destroyer No. 40, *Beale* (Wm. Cramp & Sons):	
Speed on standardization trial (average of 5 highest runs)	32.110
Speed on 4-hour full-speed trial	29.649
Torpedo-boat destroyer No. 41, *Jouett* (Bath Iron Works):	
Speed on standardization trial (average of 5 highest runs)	32.980
Speed on 4-hour full-speed trial	32.266

	Knots.
Torpedo-boat destroyer No. 42, *Jenkins* (Bath Iron Works):	
Speed on standardization trial (average of 5 highest runs)	33.022
Speed on 4-hour full-speed trial	31.272
Battleship No. 30, *Florida* (navy yard, New York):	
Speed on standardization trial (average of 5 highest runs)	21.954
Speed on 4-hour full-speed trial	22.080
Battleship No. 31, *Utah* (New York Shipbuilding Co.):	
Speed on standardization trial (average of 5 highest runs)	21.288
Speed on 4-hour full-speed trial	21.042
Battleship No. 33, *Arkansas* (New York Shipbuilding Co.):	
Speed on standardization trial (average of 5 highest runs)	21.202
Speed on 4-hour full-speed trial	21.051
Submarine No. 24, *E-1* (Electric Boat Co.): Speed on 4-hour full-speed trial.	13.44
Submarine No. 25, *E-2* (Electric Boat Co.): Speed on 4-hour full-speed trial.	13.47
Submarine No. 20, *F-1* (Electric Boat Co.): Speed on 4-hour full-speed trial.	13.812
Submarine No. 21, *F-2* (Electric Boat Co.): Speed on 4-hour full-speed trial.	14.04

The following are the percentages of completion of the machinery of vessels now under construction:

Battleships: *Wyoming*, 95.10; *New York*, 33.14; *Texas*, 66.80; *Nevada*, 6.62; *Oklahoma*, 0.70.

Torpedo-boat destroyers: *Jarvis*, 90.50; *Henley*, 92.09; *Cassin*, 36.74; *Cummings*, 36.74; *Downes*, 6.87; *Duncan*, 41.04; *Aylwin*, 53.17; *Parker*, 49.61; *Benham*, 44.15; *Balch*, 40.41.

Colliers: *Proteus*, 45.90; *Nereus*, 42.40; *Orion*, 100; *Jason*, 54.76; *Jupiter*, 44.

Seagoing tugs: *Sonoma*, 89; *Ontario*, 94.

Submarines: *F-3*, 100; *F-4*, 93.50; *G-1*, 98; *G-2*, 98.10; *G-3*, 13.05; *G-4*, 80.75; *H-1*, 78.96; *H-2*, 78.93; *H-3*, 65.70; *K-1*, 22.51; *K-2*, 20.18; *K-3*, 20.03; *K-4*, 16.50; *K-5*, 2.53; *K-6*, 1.81; *K-7*, 2.43; *K-8*, 2.43.

INSPECTION OF MATERIAL.

Comparison of the inspection work performed during the fiscal year ending June 30, 1912, with that of the preceding fiscal year, is indicated in the table below:

Bureau.	Pounds inspected and passed.	
	1911	1912
Steam Engineering	22,048,299	31,384,718
Yards and Docks	22,356,880	27,423,467
Supplies and Accounts	8,629,180	4,095,397
Construction and Repair	416,087	257,530
Ordnance	1,400,851	89,852
Equipment	366,284	11,750
Navigation	44,643	.....
Medicine and Surgery	13,125	.....
Miscellaneous	4,045	.....
	55,279,394	63,262,714

The amount of material reported under the Bureau of Supplies and Accounts is material under the cognizance of that bureau, in addition to material purchased for the naval supply account, which includes material for other bureaus.

Number of—	1911	1912
Districts	9	9
Officers in charge	8	9
Civilian assistants	27	29
Warrant officers	2	1
Chemists	1	1
Manufacturing establishments at which inspections have been made	532	588

The work in the laboratory at South Bethlehem is performed by an assistant inspector of engineering material, who is also a chemist.

ENGINEERING EXPERIMENT STATION, ANNAPOLIS, MD.

The experiment station at Annapolis has continued its valuable work and has constantly added to the efficiency of the apparatus and the quality of the material purchased for the service; tests and experiments have been continued and much information of value to the service has thus been obtained. The study of corrosion of boilers, condensers, and piping; of lubricating oils which have given trouble in the service have afforded most valuable information, as has the photomicrographic laboratory, particularly when taken in connection with the results of chemical analysis and physical tests.

H. I. CONE,
Engineer in Chief, United States Navy,
Chief of Bureau.

The SECRETARY OF THE NAVY.

REPORT OF THE PAYMASTER GENERAL OF THE NAVY, CHIEF OF THE BUREAU OF SUPPLIES AND ACCOUNTS.

NAVY DEPARTMENT,
BUREAU OF SUPPLIES AND ACCOUNTS,
Washington, D. C., November 8, 1912.

SIR: I have the honor to present the report of the Paymaster General of the Navy upon the operations of the Bureau of Supplies and Accounts for the fiscal year ending June 30, 1912, accompanied by tabulated statements showing in detail the cost of maintaining the fleet and navy yards and stations.

These statements cover all transactions involving expenditures for the Naval Establishment and show in principal items as follows:

Amounts drawn from the Treasury	$133,449,012.83
Expenditures on account of construction of new ships, including labor and material	24,930,490.79
Cost of repairs to ships and equipage at home and abroad	9,095,059.17
Cost of maintaining ships in commission (other than receiving ships), including pay of officers and men, subsistence, and incidental expenses	34,175,992.55
Cost of maintaining receiving ships, including pay of officers and enlisted men, subsistence, and incidental expenses	5,861,308.47
Cost to the Navy:	
Of the Lighthouse Establishment	30,366.45
Of the Fish Commission	88,006.78
Of the Naval Militia of the several States	42,806.98

* * * * * * *

ACCOUNTS OF THE BUREAU.

During the year considerable attention has been given to the subject of so modifying the accounting methods in the bureau as to bring them into complete accord with the requirements of Treasury Circulars Nos. 34 and 35. This has been accomplished so far as appropriations, funds, assets, and liabilities are concerned. On July 1, 1912, the new system was to this extent initiated.

Certain material benefits will be realized by the changes that have been made, not only to the advantage of this bureau, but, through the improved forms of reports and of the data made available, to the other bureaus also. For example, as revised the system will permit of a balance being obtained of the funds group independently of the remaining general ledger accounts, such as "Work in progress," "Stores," and "Capital" accounts, thus enabling them to be closed up monthly coincident with the rendering of reports of appropriation balances to the bureaus concerned. In the past this was accomplished quarterly only.

The system of allotting funds under the appropriations of the several bureaus has been extended, beginning July 1, 1912, to include not only authorized expenditures for labor and material on navy-yard work, but to cover issues of articles of equipage to vessels based upon estimates submitted by general storekeepers.

Allotments will also be set up on the bureau's books for issues of material for use and for purchases on board ships, based upon the quarterly money allotments for each department of the vessel allowed by General Order No. 121, the amounts so charged being divided between the fleets for the purpose of more readily and immediately making necessary adjustments. As allotments will likewise be made to foreign stations, the practice of charging to the appropriations a lump sum as an estimate for "Foreign account" has been discontinued.

It is believed that this extension of the allotment system will be of decided advantage to all bureaus, as it will no doubt result in showing more promptly and accurately the conditions of their respective appropriations.

NAVAL SUPPLY ACCOUNT.

During the past fiscal year the operation of the naval supply account as created by the act of June 25, 1910, and modified by the act of March 4, 1911, has been satisfactory. All stores purchased, with the exception of those named in the law, and ordnance, which was excepted by the Secretary of the Navy, have been taken up immediately after receipt and inspection and held in the naval supply account until issued for use. Materials returned to stock under the naval supply account have been the subject of operating credits to the appropriations to which they were formerly charged, and all stores have been charged to the appropriations covering the object for which they were drawn from stock.

The operating credits for the fiscal year 1911 amounted to $1,001,179.13, which sum was actually turned into the surplus fund of the Treasury and released to other uses of the Government. For the fiscal year 1912 the amount was $914,743.13, making a total of $1,915,922.26 for the two fiscal years the naval supply account has been in operation.

THE COST-ACCOUNTING SYSTEM.

The cost-accounting system which was established at the Boston yard in July, 1909, and in the following year extended to the other industrial yards, is progressing in a most satisfactory manner. Work has been so systematized that returns showing the charges to appropriations are invariably received in the department from the 5th to the 8th of the succeeding month, and invoices for manufactured articles and reports of completed work are furnished promptly, whereas prior to the inauguration of the new system it required from 15 to 30 days to furnish this information.

As the system of cost accounting has developed it has been found possible to extend it in such a manner as to include in the indirect or overhead many charges which have heretofore been omitted. These charges, however, can not actually be made against appropriations and job orders, owing to existing statutes. Until needed changes in the law are secured they will be carried, as they now are, merely as memoranda, which will give most important and interesting data. The charges which it is proposed thus to include in the indirect expense in memorandum form pending the enactment of necessary legislation are: First, pay of the clerical and drafting forces; and, second, the expenses for renewals and replacements when estimated to exceed the amount as laid down in the accounting instructions. As soon, however, as suitable legislation is obtained from the Congress it will be possible immediately to put into effect the actual charging of those items to the indirect expense without any radical changes in either the system or the instructions.

GENERAL STOREKEEPING SYSTEM ASHORE.

Two marked improvements in the general storekeeping system ashore have been brought about by designating particular yards as distributing points for certain purchased and manufactured stores.

Under the system of having large purchases of articles ordinarily used assigned to particular yards as distributing points, not only has uniformity in the articles required for by different vessels been secured, but a considerable reduction in the cost thereof has been effected.

GENERAL STOREKEEPING SYSTEM AFLOAT.

The continued operation of the general storekeeping system afloat has fully justified the faith placed in the theory of the consolidation of stores and accounts under one officer. Economy has resulted from the fact that the loss through waste, deterioration, and obsolescence has been restricted to a great extent. A careful consideration of the amount of work accomplished afloat during the present fiscal year demonstrates the thoroughness with which the single stock of supplies has been maintained on each vessel. The commander in chief of the North Atlantic Station is working with the bureau to reduce stock carried aboard ship and to make vessels of the same class more uniform in all respects.

A pressing necessity is felt for the creation of a permanent branch of general storekeepers' yeomen, or else the adoption of a rigid system

by the department which will prevent the frequent change on board ships of yeomen to and from duty in the general storekeeping department. This is now a source of more or less annoyance and inefficiency, varying as the particular conditions on each vessel differ. The proper administration of the general storekeeping system afloat requires yeomen skilled not only in purely clerical work, but also possessed of a fairly wide technical knowledge regarding the supplies and material handled, and this can be gained only through the experience derived from long continued and uninterrupted service in this branch. It is desired also to emphasize here the importance of having on every ship a single, large storeroom, or an assignment of smaller storerooms immediately adjacent to each other, for the proper storage and care of all Title X supplies. With the exception of ships of the *Dreadnought* class, nearly all vessels at present suffer from lack of proper storerooms suitably grouped, it being necessary to carry such material in ill located and widely separated compartments. It is believed that this can be remedied in practically every case by minor alterations in partitions and bulkheads in no way affecting the structural stability of the ship.

Economic storage and issue, with the highest all-round efficiency in the operation of the system afloat, can be attained only with adequate facilities and a trained personnel. The just placing of responsibility and accountability depends upon these requisites absolutely.

PURCHASES AND CONTRACTS.

During the past year the department's efforts to purchase supplies in accordance with the best commercial practice have been continued with considerable success. The opinions and advice of representative firms have been solicited, and commercial methods of classifying material followed as far as possible, with the result that business with the Navy Department is becoming popular with many manufacturers who have heretofore refrained from bidding on Government proposals. Evidence of this is afforded by the great and recent increase in the number of new contractors submitting bids. This is particularly true in the case of manufacturers of textiles, shoes, provisions, and general supplies, who are now adopting the policy of eliminating middlemen and bidding directly on the Navy's proposals. The resultant lowering of prices, as well as the avoidance of confusion and delay, has been marked.

A further economy has been effected through the consolidation of purchases for the various yards, the quantities now purchased under one contract or order being sufficiently large to induce new manufacturers to equip their plants with proper machinery and patterns for handling this class of business promptly and satisfactorily and without the intervention of jobbing houses. This makes it possible to procure material complying strictly with the Navy specifications at quotations figured as closely as possible, and has operated to offset somewhat the general increase in the market price of raw material that has been noted during the past year.

The system of making purchases under annual contracts for those supplies which do not materially fluctuate in price has been extended in the last 12 months to the decided advantage of the Government. A thorough and systematic investigation of the present methods of

buying is being carried on with a view to its further extension as well as a greater simplification and improvement generally of the purchasing system.

The present prompt awards of contracts for supplies frequently receive favorable comment from bidders and manufacturers. With the exception of those items which require the test of samples or extensive technical consideration, awards are usually made within five or six days, which is an exceedingly short time when it is considered that from 200 to 300 bids are received at each opening of proposals, all of which have to be closely examined and verified. These bids are received open to the inspection of the public and of everyone interested in the business involved. The short time needed compares most favorably with railroads and large commercial institutions. In the case of metals and other supplies for which there is a widely fluctuating market, and on which bidders submit prices with close margins of profit, or material which is urgently needed, telegraphic awards are made, frequently within an hour or two after the bids have been recorded, and invariably never later than the day of opening.

EMPLOYMENT OF OFFICERS BY CONTRACTORS.

The bureau, in the purchase and inspection of supplies of all kinds, has found itself very much hampered by that section of the naval appropriation act approved June 10, 1896, which made unlawful after June 30, 1897, the employment of any officer in the Navy or Marine Corps, on the active or retired list, by any person or company furnishing naval supplies or war material to the Government. This section reads as follows:

> That hereafter no payment shall be made from appropriations made by Congress to any officer in the Navy or Marine Corps on the active or retired list while such officer is employed, after June thirtieth, eighteen hundred and ninety-seven, by any person or company furnishing naval supplies or war material to the Government, and such employment is hereby made unlawful after said date.

The interests of the Government have been very often inconvenienced, and not infrequently injured, by the operation of this law. Realizing this, the Senate Naval Committee, at the last session of the Congress, favorably passed upon a clause repealing the law in question and intended to be included in the appropriation act for the fiscal year 1913. In spite of this favorable action, however, the section accomplishing the repeal was not incorporated and enacted. The bureau believes that this was due entirely to failure to realize the important advantages that would be gained by the Government if the restrictions of the act of June 10, 1896, were removed, and that if the matter be fully considered at the next session of the Congress these restrictions will be annulled.

It is the bureau's unqualified opinion that the employment of both active and retired officers by contractors would work to the undoubted good of the Government, as these officers, with their special knowledge of the peculiar requirements of the service, and with the best interests of the service at heart, would be in a position greatly to aid the prompt procuring and delivery of supplies and material measuring up fully to the particular and rigid specifications of the department.

SPECIFICATIONS.

At the close of the year 1911 there were 827 standard specifications. During the past year some of these specifications have been largely added to and many of the old ones have been revised, brought up to date, and drawn in language generally more acceptable and understandable to all bidders. In this, effort has been directed toward placing the material used by the Navy on a plane as nearly commercial as possible without ceasing to maintain the high standard of supplies required for use in yards and aboard modern men-of-war. Advice and suggestions from manufacturers and dealers have often been solicited and taken advantage of whenever practicable. Several important conferences with manufacturers' representatives have been held by the Navy Department. The resultant clear, concise specifications, together with rigid inspections at the places of manufacture or delivery, have insured to the Navy a high quality of material with little complaint and friction on the part of contractors.

MEAT INSPECTION.

The valuable service rendered the Navy Department for the past two or three years by the Bureau of Animal Industry in the inspection of meat and meat-food products, butter, and other articles has, within the 12 months just elapsed, with the hearty cooperation of the Department of Agriculture, been materially improved. Central inspection points have been established at the navy yards at Boston, New York, and Philadelphia, to each of which is attached an experienced inspector of the Bureau of Animal Industry and to whom all deliveries of meats and meat-food products for navy yards and vessels are presented for inspection prior to final delivery. This has resulted in the delivery on the part of contractors of a uniformly high quality of provisions at these yards, and the information and instruction obtained by pay officers from these inspectors has done much to improve the inspection of provisions at other points. The Navy Department has also authorized the inspectors of the Bureau of Animal Industry at the various cities where naval contracts are awarded to make frequent inspections of the places of business of contractors in order to insure their being maintained at a high standard of cleanliness and efficiency.

INSPECTION OF CLOTHING AND OTHER MATERIAL.

The practice of maintaining resident inspectors at the mills of contractors for clothing, textiles, shoes, and other articles has been extended wherever practicable, with the result that the Navy Department is procuring, at most reasonable rates, a splendid quality of these supplies. It would be difficult to procure, at retail, material of equal quality at less than double the prices charged to the enlisted personnel. In fact, material rejected by the department's inspectors is frequently sold in stores at higher prices than are paid by the Government for that which is passed as satisfactory and acceptable under contract.

COAL AND FUEL OIL.

Atlantic coast coal.—The highest grade of steaming coal from the Pocahontas, New River, Georges Creek, and Eureka fields has been supplied the fleet at the lowest market prices. The department, through its arrangements with coal suppliers, is able to load at short notice about 40,000 tons per day at Hampton Roads and Baltimore.

Pacific coast coal.—The results of several tests of the most promising of Washington State coals and three of the best British Columbia coals have shown that none of these high-volatile coals is adaptable for naval use, nor is any, on the whole, as economical as eastern coals. Owing to the vital necessity for a source of supply for high-grade coal on the Pacific for the maintenance of our fleet, and feeling assured that such a supply lies only in the Matanuska and Bering River fields of Alaska, the department has recommended that suitable legislation and appropriation be secured for mining and operating certain areas of these fields as early as practicable.

Fuel oil.—During the past fiscal year about 16,000,000 gallons of fuel oil, purchased at a most reasonable price, have been consumed on the Atlantic and Gulf coasts. With only one oil-carrying cargo vessel, deliveries of fuel oil have been somewhat hampered, but not so as seriously to interfere with the movements of vessels. With two additional oil carriers, distribution to the fleet and yards will be much improved.

The necessity of larger tankage facilities at our naval stations is apparent. It is felt sure that the cost of fuel oil would be lessened with increased yard facilities for handling, since the contractors would thus be largely relieved from present demands on their equipage for Government use.

During the fiscal year 1912, 729,903 tons of coal were consumed by the fleet, at a cost of $2,971,543.05, of which 25,633 tons, valued at $107,780.80 were consumed by the yard craft. The following table shows the total consumption aboard naval vessels during each of the fiscal years 1906 to 1912, inclusive:

Years.	Tons.	Years.	Tons.
1906	436,654	1910	651,241
1907	521,990	1911	744,423
1908	618,085	1912	729,903
1909	813,615		

The consumption of fuel oil on board naval vessels during the fiscal year 1912 amounted to 14,146,714 gallons, valued at $340,387.07, while the aggregate consumption during the fiscal year 1911 was 5,778,657 gallons, valued at $131,176.75.

The total quantity of domestic coal purchased was 804,554.61 tons, 189,141.01 tons of which were transported to navy yards, naval stations, and naval coal depots by means of chartered vessels, foreign and American, at a total cost for transportation of $909,005.54, or an average cost for transportation of $4.80+ per ton. The balance of the domestic coal purchased, being 615,413.60 tons, was delivered to navy yards, stations, and coal depots, as well as to vessels of the

different fleets, etc., by naval colliers, for which there were no transportation charges.

A total of $2,123,018.74 was paid for all the domestic coal purchased, which amounted to 804,554.61 tons, at an average of $2.63+ per ton, and it will be noted from statement K, Table 3, that the total cost of all coal purchased, including the cost of that transported, was $3,032,024.28, and that the average cost of it, together with the cost of that transported, was $3.76+ per ton.

ADMINISTRATIVE EXAMINATIONS.

It is desired to invite attention to those sections of the Paymaster General's Reports for 1910 and 1911 which recommend that the Congress be requested to enact legislation that will permit the establishment of a suitable system of administrative examinations. As stated in my last report—unless the provisions of the appropriation act for the legislative, executive, and judicial expenses of the Government for the current year can be construed as authorizing the establishment of the system—the Navy Department is the only department of the Government which can not, under existing law, give such an examination to the accounts of all of its disbursing officers.

The great advantages that would undoubtedly arise from preliminary administrative audits are so obvious that the necessity of enumerating them is not felt, especially as my report for the year 1910 goes into the subject with detail. Suffice it to say, that the unqualified success which administrative examinations have proved to be in the War Department and other departments of the Government make it certain that the extension of the system to the Navy Department would yield similarly excellent results.

CONSOLIDATION OF APPROPRIATIONS.

As the new methods of bookkeeping for the Naval Establishment are developed along the lines as laid down by the President's Commission on Economy and Efficiency, the necessity for a rearrangement or consolidation of appropriations for the Navy is clearly shown and becomes more evident.

The reasons for consolidation are pointed out in the Annual Report of the Secretary of the Navy for 1911 and the Annual Reports of the Paymaster General for the fiscal years 1910 and 1911. This consolidation may be made in two ways: First, by consolidating the appropriations of each bureau into one appropriation for the particular bureau; second, by consolidating all the maintenance or operating appropriations into one, which would be allotted to the several bureaus by the department. In this second method such appropriations as "Pay of the Navy," "Public works," and "Coal and transportation," "Provisions, Navy," and others, owing to their special nature, would of necessity be kept separate and not included in the general appropriation. The second method has many advantages to recommend it, but the change would be of such a radical nature that it is not believed expedient to adopt it at the present time. The first method, on the contrary, has the approval of the various bureaus, and its adoption is a matter of urgent need.

In connection with the consolidation of appropriations, the following is quoted from the Annual Report of the Paymaster General for the fiscal year 1911:

A distinct advantage to the Government would be gained by the removal of the limit on payment under gross appropriations for clerical, drafting, and messenger service, the amounts to be paid for such services to be left to the discretion of the Secretary. The payment for all personal services other than those which enter into the cost of work from the appropriation would undoubtedly prove economical, as at present when the services of draftsmen and others are needed in excess of the number for which payment has been provided by law they can not be employed. For this reason a considerable loss inures to the Government through delays in obtaining drawings, specifications, and other necessary data.

Not only should this limit on payment under gross appropriations be removed, but the pay of clerical, drafting, and messenger services at navy yards and stations should be included in the cost of work. This is not done at the present time and leads to criticism of the accounting system.

To emphasize the necessity for the consolidation of appropriations, the following is quoted from the same report, as pointing out the best reasons therefor:

The naval appropriations at the present time are very complex, and many of them carry identical clauses. Their consolidation would simplify all business transactions connected with purchases, permit more accurate cost accounting, facilitate the reporting of expenditures, and result in an economical distribution of funds by administrative authority at the time the necessity for each allotment becomes evident.

APPROPRIATIONS BEARING TWO FISCAL YEARS IN THEIR TITLES.

An anomalous condition not infrequently arises in the purchase of stores of a certain class because of the fact that they are produced at particular times or seasons of the year and may be obtained in better quality and at cheaper prices at these seasons.

This applies more particularly to provisions, many varieties of which are procured more economically in the spring or early summer, at which times it is desirable to lay in the stock for the succeeding fiscal year beginning on the 1st of July. This requires that the department shall contract in the spring for great quantities of stores and must pay for them from the appropriation for the fiscal year then current, as no other appropriation is in existence and the contractor can not be asked to wait, although it is well known when such purchases are made that no part of the provisions are intended for use, or will be used, within the fiscal year.

The legality of this proceeding is questionable, since purchases for the need of a certain fiscal year may not be properly charged to the appropriation of another year. The practice has been to pay for these stores from the appropriation current at the time of purchase, and later to adjust the matter by transferring the debit to the appropriation of the succeeding year after the 1st of July.

The necessity for these purchases at seasonable times is clear, and means should be provided by law which will render the procedure unquestionable.

In order to eradicate this difficulty the appropriation "Provisions, Navy" needs to be provided with the double year hereafter, so that it may undoubtedly be available for expenditure throughout two full years.

In view of the condition which recently confronted the Navy because of the lack of any appropriations for the fiscal year 1913, it would seem a wise measure to extend this principle to all annual appropriations of the Navy for the purpose that the continuation of operations may not be stopped entirely by such contingencies. This principle is already in force as regards many of the working appropriations of the Army, and its extension to the Navy would be in line with good business principles.

THE NAVY RATION.

During the past year every effort has been made to keep down in all possible ways the average cost of the Navy ration, without, at the same time, in any measure decreasing the nutritive value and pleasing variety for which the Navy ration is deservedly noted.

The cost of the ration for some years has been steadily increasing as a result of the continued upward tendency of the prices of subsistence supplies, but it is believed that as a result of instructions issued to the service, limiting the proportions to be used of the more expensive articles constituting parts of the Navy ration, particularly the meat components, that the increase has been much less than proportionate to the great increase in the cost of all food supplies. The meat components, universally largely advanced in prices, oppose the greatest difficulty to effecting an appreciable cost reduction.

COMMISSARY STORE.

The commissary store which was established at the Washington Navy Yard on October 17, 1910, in accordance with the act of Congress of March 3, 1909, has proven an unqualified success and has gone far toward relieving to some extent the burden of the high cost of living borne by officers and enlisted men of the Navy and Marine Corps on duty in the vicinity. The act referred to was a step in the direction of equalizing the pay and allowances of the officers and enlisted men of the Army, Navy, and Marine Corps, as was the intention of the act of May 13, 1908.

The establishment of commissary stores in other navy yards and stations will be effected as soon as pay officers become available for these important duties. The present shortage of officers makes such details impracticable.

AN ADDITIONAL PAYMASTER ON LARGE SHIPS.

The many duties now devolving upon pay officers afloat are such as to render it extremely desirable, if not absolutely necessary, that a junior paymaster be placed on every large ship; this additional officer to act independently of the senior, and not as an assistant to him, being solely responsible and accountable for the performance of all work in the commissary department. Since the establishment of the general storekeeping system on vessels, the number of duties and their inherent multiplicity of detail has so increased that it is physically impossible for one officer to bestow that close attention upon all the different branches of his department which is essential to achieve the most efficient results.

An urgent need is felt for sufficient officers to permit of the placing of an additional paymaster, acting in an independent capacity, upon every large ship. As again pointed out for the purpose of emphasis,

the volume of work for the proper execution of which the present single pay officer is directly responsible, has become so great that he can not give that intimate personal supervision to its performance necessary in every way both to an economic administration and the protection of his own interests as the bonded custodian of public properties and money.

CIVIL-SERVICE CLERKS ON FOREIGN DUTY.

The bureau desires to note a hardship which is suffered by clerks who are assigned to duty on stations outside the continental limits of this country. At present a most unjust discrimination operates against them in that, after performing the required two years' service abroad and returning to the United States, they do not find permanent billets awaiting them immediately upon arrival. On the contrary, the only opening offered them under existing conditions is the placing of their names on the eligible list. This, however, in nearly every instance, causes them to go from three to six months before succeeding to new positions, during which period they receive, of course, no pay. Nor is this the only disadvantage they suffer. When they do succeed to new and permanent positions, after enforced waiting, it is usually at a rate of pay considerably less than that which they received either while abroad or in the billets they filled previous to leaving this country. The injustice of this is glaringly apparent. Foreign service, if any difference in status at all is to result, ought to count to their benefit rather than to work to their undoing.

The greatest difficulty is and will continue to be experienced, even under favorable circumstances, in getting competent clerks of the right type to go to duty abroad. The handicap above referred to is making it increasingly harder every year. Unless a remedy is afforded it will in a very short time become practically impossible to secure good men for this service.

In order to relieve the present situation and to avoid the future serious crippling of the clerical force on foreign stations, and as a matter of simple and unquestioned justice to the clerks themselves, it is strongly recommended that corrective departmental action be taken at the earliest opportunity.

BUREAU OF EQUIPMENT.

In the year just closed inconvenience and confusion has continued to be suffered due to the failure of the Congress to enact legislation effecting the full abolishment of the Bureau of Equipment. A greatly needed simplification in work and accounts has thus been prevented.

It is deemed worthy of comment that in the Bureau of Supplies and Accounts alone the complete abolishment of the Bureau of Equipment would make it possible to discontinue the keeping of some 38 accounts. The consequent saving of clerical labor, which could thus be diverted to other work of a pressing and important nature, would result most advantageously, relieving, although in only a slight degree, the inconvenience and delay occasioned by the present shortage of clerks. Voluminous correspondence among the several bureaus of the department would also be obviated, as well as to and from navy yards and cruising vessels—corre-

spondence which is absolutely necessary so long as the Bureau of Equipment is continued, semi-existent, a kind of shadowy, neutral ground and clearing house for all duties and functions difficult to place under other bureaus. Marked improvement and simplification would likewise be felt in the preparation and handling of requisitions everywhere. With each remaining bureau having direct charge of its share of the funds, duties, and functions as distributed, fewer requisitions would need to be prepared; and with those still necessary, the confusion now a continual source of annoyance and trouble would be avoided. A wider latitude for determining charges would be another excellent result. It frequently happens at present that the procuring of absolutely essential items of equipage is delayed and sometimes prevented because none of the bureaus is able to supply them under the restrictions imposed.

SCRAP METALS AND OTHER CONDEMNED MATERIAL.

During the past year the classification and segregation of scrap metals and other waste material has received very careful attention by the bureau, with most gratifying results. A uniform salvage system has been put into effect at the navy yards, Portsmouth, N. H., Boston, Mass., New York, N. Y., and Norfolk, Va., and copper-bearing scrap is now classified and separated into various classes, and wherever possible such scrap is used in the yard foundries at a great saving to the Government. Such metals of this character as can not be advantageously used in the foundries are reworked by commercial smelters, and the pure metal recovered is returned to the Government at a very small cost for smelting.

Scrap steel and iron is now classified and sold in a manner acceptable to the trade, and the prices realized at recent sales have been from $2 to $2.50 per ton more than received for material of the same character a year ago.

The bureau proposes to install this system of handling scrap at the navy yards, Mare Island and Puget Sound, in the near future and has in course of preparation a pamphlet giving in detail the methods to be employed.

DAIRY AT THE NAVAL ACADEMY.

Realizing that the milk furnished the midshipmen at the Naval Academy was of very inferior quality and that it was supplied from insanitary dairies, and being convinced that this one article of food was responsible for a great deal of illness at the academy, the pay officer in charge of the midshipmen's store on August 29, 1910, requested that he be authorized to build a model dairy and purchase a herd of cows to remedy the conditions surrounding the milk supply. Authority was granted by the department to transfer $25,000 from the midshipmen's store fund to the dairy account, and the pay officer in charge was authorized to proceed with the erection of the necessary buildings, and to purchase farm implements and a herd of 60 cows. At later dates the department authorized additional transfers, amounting to $15,000, or a total of $40,000.

The dairy is now in full operation; two cow barns capable of housing 120 cows, and three 200-ton silos have been built, all of the most approved design and construction. A herd of 100 cows has been purchased and a farm of about 100 acres is being cultivated, on which

the greater part of the food supply for the cows is raised at a small cost to the Government.

Since the midshipmen have been supplied with milk from this dairy, intestinal troubles have practically disappeared at the Naval Academy.

Further improvement in conditions can be obtained by the purchase of a separate farm for the dairy herd.

The bureau wishes to acknowledge its great indebtedness to the Bureau of Animal Industry, Department of Agriculture, for its advice and assistance, which has contributed in such a large measure to the successful building and operation of the dairy.

CHARACTER OF WORK PERFORMED.

The bureau is gratified to note the uniformly excellent character of the work done under its jurisdiction. This has been accomplished in the face of trying difficulties with regard to the pressing shortage of pay officers and to the lack of sufficient clerical help afloat and ashore.

The duties now placed upon the Pay Corps are extremely varied and responsible, and their proper performance has exacted arduous labor. Night work has frequently been necessitated in the bureau, at the various navy yards and stations, and on board ship, in order that affairs might be kept up to date. That the work of the corps has been so successfully carried on under conditions so unfavorable is a tribute to the zeal and efficiency of both the commissioned and clerical personnel, without whose loyalty and hearty cooperation the excellent condition now existing could not have been attained.

T. J. Cowie,
Paymaster General, United States Navy.

The Secretary of the Navy.

REPORT OF THE SURGEON GENERAL UNITED STATES NAVY.

Department of the Navy,
Bureau of Medicine and Surgery,
Washington, D. C., December 2, 1912.

The following report of the activities of the Bureau is submitted.

Section I.—*Health conditions of the personnel of the Navy, and of the inhabitants of the island possessions coming under the care of the Medical Corps of the Navy.*

[Being a discussion of the incidence of important or prevalent diseases and injuries and special measures that are or should be employed to treat or combat them, with a view to increasing the efficiency of the naval establishment, at the same time conforming so far as practicable with humanitarian demands.]

I. DISEASES AND INJURIES.

A. GENERAL REMARKS.

The health of the Navy from January 1, 1911, to December 31, 1911, has been good, and shows a slight improvement over that for the previous year and a marked improvement when compared with

that for the "average year." The reduction in damage rate from injuries has been more marked than has that from diseases, both for the previous year and for the "average year." The death rate from all conditions shows a marked reduction, both from that of the previous year and of the "average year." Among the natives of Guam the births have exceeded the deaths, while in Samoa the reverse has been true. From January 1, 1912, to June 30, 1912, 26 of the naval personnel were admitted to hospitals other than naval hospitals, 10 to hospitals beyond the continental limits of the United States, and 16 to hospitals within those limits. Further, there have been 2,493 supernumeraries treated by the service during the calendar year 1911, with a total of 43,112 sick days, many of whom were officers and men of the navies of foreign powers.

B. GENERAL INFECTIVE DISEASES.

1. *Tuberculosis.*—a. Naval personnel: The admission rate per thousand for this disease shows a very slight decrease from that for the previous year, the higher figures still persisting among those whose duties confine them below decks, and the highest rate occurring among the musicians. The medical corps furnishes an unusually large number of cases of this condition. b. Native charges: It is estimated that one-sixth of the population of Guam has active tuberculosis, while the increase of the disease among the Samoans has been strikingly rapid, apparently following the recent epidemic of measles.

2. *Typhoid fever.*—a. Naval personnel: The rate per thousand for this disease shows a very slight increase over that for the previous year (the typhoid prophylactic was introduced subsequent to the period which these remarks cover), and there have been three outbreaks which were epidemic in character; one of 57 cases occurring at the training station, Norfolk, Va., between June 25 and September 27, 1911; one in the Atlantic Fleet of 20 cases, distributed among 9 ships, occurring between January 1 and March 31, 1911; and one, in the Pacific Fleet of 5 cases, occurring between September 26 and October 24, 1911, all confined to one vessel. b. Native charges: During the year there were no cases of typhoid at Guam, nor at Tutuila, Samoa; but recent returns (April, 1912) show that two cases have been imported into Tutuila, the first to be recorded in the history of that possession.

3. *Dengue.*—a. Naval personnel: Among the force in tropical countries this disease is an important feature of health conditions and is the most important tropical disease occurring among patients admitted to the naval hospital, Cañacao, P. I. At the naval station, Cavite, P. I., it is reported that its incidence has been greatly lessened, while at the naval station, Olongapo, P. I., not a single case occurred during the six months previous to May, 1912; whereas for the year 1911 an admission rate per thousand of 136.5 is recorded. For the entire service the admission rate per thousand for 1911 was 13.69. b. Native charges: The rate for this disease among the native population is not as high as for the naval personnel, but Tutuila, Samoa, has recently been visited by a sweeping epidemic.

4. *Malaria.*—a. Naval personnel: The admission rate per thousand for this disease has been slightly increased over that for the previous year. Its incidence at Olongapo, P. I., and Camp Elliott,

C. Z., has been markedly reduced; but the rifle range, Winthrop, Md., has become a fertile source of infection. During the year 163 cases of the aestivo-autumnal type were reported, originating mostly in Central America and the West Indies. b. Native charges: No malaria is reported from Guam, or Tutuila, Samoa; but it is prevalent at Cavite and Olongapo, P. I.

5. *Contagious diseases.*—a. Naval personnel: While these diseases furnish a relatively high rate per thousand (105.14 for 1911 and 123.52 for the previous year), and are persistently a cause of great damage (196.10 for 1911), there have been no large epidemics and their occurrence has been confined largely to those new in the service, and especially to those at training stations, where these diseases may be considered endemic. Only two cases of *smallpox* occurred during the year. b. Native charges: A severe epidemic of *measles* visited Tutuila, Samoa, resulting in a death rate of 8.6 per cent, the cases being confined to individuals less than 18 years of age, which comprises the population born since the last outbreak.

6. *Other diseases of this class.*—No *yellow fever* occurred during the year 1911, but, due to unavoidable exposure in an infected South American port, there was an outbreak of eight cases on the *Yorktown*, lasting from January 15 to 27, 1912, with a mortality of 25 per cent. There have been only 36 cases of *diphtheria*, 12 of *cerebrospinal meningitis*, but *tonsillitis* shows a considerable increase as compared with previous years. No infection with *gangosa* has occurred among the naval personnel, but among the native population there are now 330 cases recorded in Guam, which gives a rate of 27.7 per thousand. *Leprosy* occurred in only one individual of the naval personnel during 1911, a Chinese mess attendant on the Asiatic station. (Another case was reported July, 1912, in the person of a Hawaiian on one of the ships of the Atlantic fleet.) *Filiariasis* has not been reported as occurring in the naval personnel; but among the native charges at Tutuila, Samoa, it is very prevalent.

C. VENEREAL DISEASES.

1. *Combined.*—The combined admission rate for venereal disease was 183.56 per thousand, and while this shows a considerable reduction from that for the previous year, it still exceeds the damage rate of any other disease.

2. *Singly.*—The three more important diseases under this group are alone considered. Syphilis shows an admission rate of 29.65 per thousand, gonorrhea 93.44, and chancroid 31.82, while the rates for the previous year were 24.24, 105.12, and 34.28, respectively.

D. SKIN DISEASES.

The occurrence of this class of disease is still greatest among those new in the service and causes a high degree of damage, the rate per thousand being greater than that for the previous year.

E. GASTROINTESTINAL DISEASES.

The rate for these conditions shows a slight increase over that for the previous year, but the reduction among midshipmen has been marked.

1. *Intestinal parasites.*—a. Naval personnel: The incidence of hookworm among recruits at the Naval Training Station, Narragansett Bay, R. I., has been studied and the results show that 28 per cent of men from the Southern States are infected, and of these 50 per cent come from South Carolina and Alabama. b. Native charges: Every native in Guam is infected with one or more types of intestinal parasite, the *Ascaris lumbricoides* being practically universal. In Tutuila, Samoa, it is estimated that 90 per cent of the population harbor the hookworm.

2. *Dysenteric affections.*—The rate per thousand for these conditions shows a reduction when compared with the previous year, and although most cases are reported from the Tropics, many are now returned as primary in stations in the temperate zone.

F. OTHER DISEASES.

1. *General.*—*Mental diseases* show a slight increase when compared with the previous year, while *alcoholism* has decreased. Several unusually severe cases of *poisoning by jellyfish* have been reported from Philippine and West Indian waters, and several cases of *ptomaine poisoning* occurred on one of the ships of the battle fleet, due to the use of undressed, cold-storage fowl. Among the natives of Samoa the so-called "Samoan conjunctivitis" (a disease resembling trachoma) is very prevalent, but as yet no cases have been reported among the naval personnel.

2. *Occupational.*—*Lead poisoning* is now recognized to be more common among the naval personnel than was formerly supposed, and its incidence is not confined to painters. It has also been found to exist in a severe type among certain of the civilian employees at navy yards, especially those engaged in manufacturing and mixing paints. True cases of *heat exhaustion* are not common in the Navy, and are practically confined to the fire and engine room force, but the condition of thermic myalgia, or *heat cramps*, is quite common among this same occupational group. Several mild and a few severe cases of *caisson disease* have occurred among divers.

G. INJURIES.

The admission rate per thousand for injuries still remains high, although there has been a certain amount of reduction from that both for the previous and the "average year".

1. *General.* *Flat foot* and *hernia* still cause a considerable degree of damage, but there has been a reduction from that recorded for the previous year.

2. *Occupational.*—*Eye strain* and *injuries* to the visual apparatus resulting from the use of *telescopic sights*, the *periscope*, and high-powered *searchlights* are still evident, and it has been found that many gun pointers and trainers have a considerable degree of astigmatism, which unfits them for the duty they are performing, while the use of the periscope has not infrequently resulted in temporary double vision. The constant necessity for the employment of *artificial illumination* below decks still produces its bad effects, more especially among the clerical force, and the incidence of *foreign bodies* (coal dust and cinders) in the *eyes of the fireroom force* has been marked, giving rise not so much to serious injury as to a loss of time and

efficiency. On one of the armored cruisers of the Pacific Fleet during a forced-draft run 5 per cent of the firemen needed attention on this account, necessitating an average loss of service of five minutes each.

H DEATHS.

Drowning has given rise to a greater number of deaths than any other one cause during the year, as it did last year; but the rate has been reduced, while the deaths from *suicide* are double those of the previous year. *Unusual causes* of death have been reported; three from hanging, and one each from inhalation of chloroform (self-administered for the relief of neuralgia), and lightning stroke, the latter occurring at Winthrop, Md., 2d June, 1912.

II. CURATIVE MEASURES, HYGIENE, AND SANITATION.

A. GENERAL REMARKS.

The careful and accurate observations of the medical officers of the Navy and the intelligent interpretation of statistics have pointed out to the bureau more clearly than ever before the spots in our armor of defense against disease that must be strengthened. The policy of requiring *annual and monthly sanitary reports* from the various ships and shore stations has again proven its value, and coupled with the willing support of the Navy Department, has enabled the bureau to rectify many insanitary conditions of which otherwise it would have been in ignorance. The new and recognized *methods of medical and surgical treatment* have been adopted, and the bureau has made special effort to keep *medical officers, qualified in special branches*, on duty at the important hospitals and in the fleets. In the case of the fleets it has been impracticable to carry out this latter plan as fully as desired owing to the lack of much needed *hospital ships* on the Pacific and Asiatic stations. In the Pacific Fleet *temporary camps for convalescent patients* have been established from time to time where the vessels were assembled at some convenient point, resulting in rapid recuperation, thus doing away in many cases with the necessity of transfer to a hospital and the consequent loss of time and necessary substitution of untrained for trained men and therefore reduction in fleet efficiency. The *care of the natives at Guam, Samoa, and in the Philippines* continues to be of great value to these people and a source of interest and instruction to the medical officers of the service. The medical and surgical clinics at the Cañacao hospital have been extended, and now all the emergency operative work for Cavite Province is performed at that hospital, a marked advance along humanitarian lines. The establishment of the *office of first lieutenant* has proven a great aid to the prosecution of sanitary measures on board ship. *Cooperation of municipal authorities* with the medical officers of the Navy has in certain instances been of inestimable value to the service in reducing the damage from disease, notably at Norfolk and other towns adjacent to Hampton Roads and at Cavite and Olongapo, P. I. On the other hand, lack of such cooperation has led to much unnecessary discomfort and morbidity.

B. GENERAL HYGIENIC AND SANITARY FEATURES.

1. *Relative to force afloat.*—a. Physical exercise and recreation: The *setting up drills* should be participated in by all officers and men. The present character of these exercises is not satisfactory, and it is probable that a further study of the system that has been recently introduced at the Naval Academy will develop its adaptability to use throughout the service. In addition to those exercises prescribed, the individual use of the Müller system is strongly urged. *Swimming.*—Officers and men should take every opportunity to indulge in this sport, and especially to master the art of swimming in rough water. It should be engaged in not only for its beneficial effects as a healthful exercise, but also for its distinct value as a life-saving measure in emergency. *Rowing, sailing, fishing,* and *hunting parties.*—In addition to the compulsory drills in rowing and sailing, the ready availability of boats for voluntary exercise of this kind and for fishing and hunting parties would add greatly to contentment and result in a marked improvement in general health.

b. Disposal of waste: (1) Garbage and trash.—Three different types of *incinerators* have been tried on battleships of the Atlantic Fleet, and all have demonstrated the practicability of the scheme, but that upon the *Louisiana* has proven the most satisfactory. Apparatus of this kind should be so installed as to minimize the dissemination, to neighboring compartments, of the heat generated, and the hopper should be so placed as to reduce the difficulty of passing the garbage from it to the drying chamber. These two requirements have not been fully complied with in those now in use.

(2) Human excreta.—*Crews' heads.*—The present types of *troughs* (from the standpoint of depth, width, system of flushing, etc.) do not conform to sanitary standards, and are a menace to health. *Slat seats* made of a single piece of close-grained wood have been installed for trial and have many advantages over metal seats. *Live steam* has been used in certain vessels for cleansing and sterilizing, and the practice should become universal. For obvious reasons the *location* of crews' heads should not be confined to one part of a vessel. *Water-closets.*—Several types now in use have inherent defects as well as those due to methods of installation and location.

c. Water supply: (1) Scuttle-butts.—On certain vessels where two large scuttle-butts are provided both are forward, and the needs of the crew would be better conserved if one were placed forward and one aft, and, further, small sized scuttle-butts should be placed in fire and engine rooms. It has been found in one vessel that the waste water from the scuttle-butt drained into the fresh-water supply used in the scullery, which indicates that all such drains should be carefully scrutinized with a view to their emptying into the steaming tanks.

(2) Sanitary drinking terminals.—The "bubbling spring" type of drinking terminal is gradually replacing the old style, common drinking cup, and should absolutely supplant it, and *all* vessels should be so supplied as rapidly as possible. The reports unfavorable to the present type of terminal are based largely upon incorrect methods of use, and it should be seen to that those who fail to properly use these valuable aids to disease prevention are instructed.

(3) Steam launches and boats.—The present method which forces the crews of small boats to obtain their drinking water from a breaker

by sucking it up through a glass tube, common to all, should be abolished, and individual canteens supplied to each member of a boat's crew.

(4) Common openings for salt and fresh water.—This arrangement has practically become obsolete, but the condition has been reported (during the year) as still existing on one of our vessels. In every instance these openings should be made distinct.

(5) Distilled water.—The waters of certain harbors, when distilled, have a disagreeable taste (the flavor of kerosene has been noted in water distilled from New York Harbor), and when a reliable supply from shore can be secured it should be used under such circumstances.

(6) The use of harbor water for cleaning purposes.—Water from harbors markedly polluted with sewage (notably New York, Philadelphia, Baltimore, and Norfolk) should not be used for scrubbing decks, cleaning paintwork, etc.

d. Ventilation and heating: (1) Forward compartments of battleships and armored cruisers.—That the ventilation of these compartments, at sea, is still an unsolved problem is witnessed by the fact that in certain instances they could not be occupied for a considerable period (notably in the case of the *Washington*, where the sick bay had to be abandoned and the sick moved to another part of the vessel). The necessity for intakes on the superstructure is imperative, and some method to accomplish this end should be devised. Officers' quarters, on some of those vessels in which they are located forward, have only natural ventilation, which is at certain times inadequate, and should be supplemented by artificial ventilation, as has been done on the newer type of vessel in which this arrangement of quarters is found.

(2) Funnel uptakes.—These great aids to ventilation are frequently entirely or partially blocked by using the platforms for stowing coaling gear, etc. They should be left free of obstructions in order that the maximum benefit may be realized.

(3) Central control stations.—All such stations are in urgent need of better ventilation in order that those assigned to duty in these compartments may be depended upon to perform their important functions uninterruptedly under battle conditions.

(4) Combined heating and ventilating systems.—This method is a good one in principle, but as at present installed on certain ships it has not met with complete success. The defects, from a sanitary point of view, are as follows: (*a*) Low relative humidity of air as delivered; (*b*) inability to maintain an equable temperature in all compartments supplied; (*c*) the necessity for shutting down the supply of heat during "coaling ship" (noticeably in northern climates in winter weather; in the case of the *Vermont* the direct method of heating used in adjacent compartments was not sufficient to warm the sick bay when its supply from the indirect system was shut off by reason of coaling ship); (*d*) the drawing in and distribution throughout the ship of insects. There is now on the market an apparatus designed to rectify these defects which has been successfully used in merchant steamers, and it is urged that this system be adapted to and installed upon naval vessels.

e. Facilities for personal cleanliness: The *increase* in the *allowance of fresh water* for bathing purposes has been markedly beneficial The

provisions for bathing in the case of the crew are universally inadequate and more space and an increase in the number of fixtures is urgently needed. *Facilities for washing the hands after visiting the "heads"* are imperative. *Laundries* are of great importance in limiting the spread of disease and their installation on shipboard should be more extended. Wherever practicable the size should be such as to permit of their use by the crew. (One ship of the battle fleet has had this principle in practice for some time, resulting in benefit to the crew and a saving of fresh water.)

f. Deck coverings, hangings, etc.: Heavy *linoleum*, if properly laid and kept free from breaks, has proven to be the best form of deck covering, though the Venetian red used in the shellac is not unobjectionable; it wears off as a red dust, and apparently causes the linoleum to "pit." If the coloring were incorporated in the body of the linoleum and the gum shellac dissolved in grain alcohol, this would very probably be avoided. *Canvas* can not be properly laid, deteriorates rapidly, and harbors disease germs. *Rugs and carpets* in compartments subject to much traffic are a menace to health and should only be displayed on state or festive occasions. *Curtains, portières, etc.*, have no place on a modern man-of-war, unless made of washable materials.

g. Structural defects from a sanitary point of view: (1) Insulation of ships' sides.—This has been found to be insufficient in certain vessels, such as the scout cruisers, and gives rise to excessive heat or cold under extremes of climate. In torpedo boats and destroyers, in addition to this condition, sweating of the sides is marked, leading to unhealthful dampness.

(2) Gunports.—When certain vessels are at sea, notably the armored cruisers, water gains entrance through the gunports to the gun deck, used largely as living and recreation quarters by the men. In rough weather this amounts to flooding with 2 to 3 inches of water, thereby doing away with all comfort and causing much unnecessary exposure. It is urged that special effort be made to devise some style of gunport which will obviate such objectionable and insanitary conditions.

(3) Ladders.—The present style of ladder, with lattice treads, leads to much discomfort and is unhygienic; a different pattern should be substituted which will not so readily catch the dirt and can be easily cleaned.

(4) Lockers.—The great difficulty of cleaning behind the numerous lockers as now installed close against the bulkhead or ship's side is recognized. This should be obviated by leaving no blank spaces around the lockers which do not permit of easy access.

(5) Junction of deck with bulkhead or ship's side.—At present the method used leaves an angle difficult to clean and well adapted for the accumulation of dirt. This should be remedied by the establishment of a cove base at all such junctions.

(6) The forward location of officers' quarters, besides being objectionable, is open to criticism from a hygienic and sanitary standpoint.

(7) Unnecessary use of cork paint.—This is frequently seen and gives rise to additional and unnecessary surfaces that readily catch dust and are difficult to clean.

(8) Bunk railings.—To prevent accidents and conduce to comfort, bunks on torpedo boats should be provided with side guards.

h. Periodic disinfection of vessels throughout has been inaugurated and will be generally carried out before ships are recommissioned after going in reserve.

2. *Relative to force on shore.*—a. Physical exercises: The personnel on shore has ample opportunity for a variety of physical exertion in addition to those prescribed, and every one should make an effort to engage regularly in some form of outdoor exercise. The new system of physical drill established at the Naval Academy should be introduced throughout the service. *Midshipmen* of the upper class were included this year, for the first time, in the compulsory exercises at the Naval Academy, and beneficial results have been evident, as is also true of the establishment of a swimming beach at that place, whereby these young men obtain the benefits of salt water bathing.

b. Disposal of waste: (1) Garbage and trash.—The best method of freeing a community of its garbage and trash is by *incineration*, though in many localities removal by contract with outside parties is available and satisfactory. Whichever method is used, the waste should be kept, while awaiting removal, in metal cans inclosed in fine-mesh wire cages, and the cans should be periodically cleaned. "Rock pile" incinerators are being used at Guam for garbage, manure, and trash with great satisfaction. An incinerator is being built at the torpedo station, Newport, R. I., and this system of disposal is in vogue at the naval training station and hospital, Great Lakes, Ill., and at the Mare Island Navy Yard. Incinerators are urgently needed at the training station, San Francisco, Cal., and at the naval station, Olongapo, P. I.

(2) Human excreta.—*Incinerators*, both of manufactured and emergency types, have proven of inestimable value, and are far superior to any system of latrines, no matter how carefully the latter may be managed. In Guam the material resulting from the use of the "pail system" is readily destroyed in "rock pile" incinerators. Such an arrangement might easily be adapted to conditions at Olongapo, P. I. Extensive *sewer systems* are being laid in Guam which, it is believed, will result in a marked diminution in the intestinal affections so prevalent among the natives. *Public latrines* are being installed in Agaña, Guam, to reduce soil pollution and limit the number of disease-spreading foci. *Water-closets and urinals.* The few remaining "outhouses" overhanging the water along the the sea walls of the navy yards are a menace to health and should be replaced by proper water-closets and urinals connected with a sewer. In navy yards there is urgent need of such facilities for visitors of both sexes, and they should be provided as soon as practicable.

c. Water supply: (1) Wells.—The water from the artesian well supplying the navy yard, Philadelphia, Pa., has been found to be unsafe, and this source is no longer used for domestic purposes The Port Royal station now receives an additional supply of pure water from artesian wells driven on the reservation. The supply of distilled water at the naval station, Cavite, P. I., has been supplemented by the driving of an artesian well which furnishes a potable water. The supply for the hospital at Las Animas has been increased and the system of distribution improved and extended.

(2) Impounded rain.—Those stations depending for their supply upon gathered rain water report that the amount is insufficient

and the quality not above suspicion. This is particularly noticeable at Tutuila, Samoa, and the magazine at Fort Mifflin, Pa. In such cases this supply should be replaced or augmented by plants for furnishing distilled or boiled water or by artesian wells.

(3) Rivers and lakes.—The filtration plant of the training station, Great Lakes, Ill., is apparently effective. It yields a sufficient and potable supply, although there is undoubtedly some pollution of the lake by sewage from neighboring towns in which typhoid fever is endemic and at times epidemic. The artesian supply for the navy yard, Philadelphia, Pa., has been replaced by the Philadelphia city water with apparently satisfactory results. The great improvement in conditions in Agaña, Guam, resultant upon the establishment of an ample and good water supply from the Fonte River is manifest, and the other towns of this island should be similarly supplied. The naval magazine, Fort Mifflin, Pa., uses, for flushing and washing purposes, the untreated Delaware River water, saturated with the sewage of Philadelphia. This condition is hardly believable, and the risk involved makes other provisions imperative.

(4) Distilled and boiled.—Certain stations have been greatly benefited by the installation of distilling plants involving great expense, but lack of funds has prevented their establishment at points in great need of a pure water supply. The system of furnishing boiled water from a large central plant is a much cheaper method of obtaining a safe and potable supply, and its use, where applicable, is urged.

(5) Sanitary drinking terminals.—This type of faucet has already been installed at many of the shore stations, and its use should be universal.

d. Dust: The grave dangers associated with the dust nuisance at the training stations at Newport, R. I., and Great Lakes, Ill., and at the Las Animas Hospital have been greatly reduced by increasing vegetation, watering and oiling, and this effort should be persisted in.

e. Vessels in dry dock: Sanitation of vessels in dry dock is unsatisfactory. Under the existing conditions there are no proper provisions for bathing or disposal of waste, and the arrangements for heating ships and the baths and water closets ashore are not adequate. The installation of apparatus which would permit of the vessel continuing in the same status as when afloat would obviate these difficulties, but a better method appears to be the construction of barracks for the housing of the personnel of all vessels undergoing repairs at navy yards and the adoption of this plan is again urged.

f. Periodic disinfection of barracks has been instituted at the Great Lakes Training Station, and, should results warrant, will be adopted elsewhere.

g. Swimming pools: The subject of the proper disinfection of water in swimming pools is an important one, and the use of free chlorine gas, furnished in tanks under pressure, is being considered.

h. Disinfectors: Combined steam and formaldehyde disinfectors of large size have proven to be indispensable at the training stations, and their installation at all navy yards and stations is urgently needed.

i. Silent signal system: This system for calling nurses in hospitals has been found to work well in the naval hospital at the training station, Great Lakes, Ill., and is a most valuable aid in maintaining quiet. Its use in all new naval hospitals is contemplated should funds be available for its installation.

j. Canteens: The establishment of canteens, under proper restrictions, at isolated hospitals has been found conducive to contentment among patients and hospital corpsmen, as they are thus enabled to obtain nonalcoholic drinks, candy, stationery, tobacco, etc., without leaving the hospital grounds.

3. *Relative to force both ashore and afloat.*—a. Physical exercise: It appears that the monthly exercise prescribed by General Order No. 193, of June, 1912, would result in greater benefit and lead to more contentment if each officer were permitted to select the form of exercise he prefers, certifying at regular intervals as to its character and amount.

b. Ration: That the *ration in the Tropics* should contain a lower percentage of protein than in the northern latitudes is well recognized, but in our Navy the matter has not received the attention it deserves. With the flexibility of the present ration no radical change need be made, as the end may be accomplished by intelligent cooperation of the medical and pay officers in individual cases, as was done on the *Connecticut*. . The waste arising from improper methods of *handling* frozen meat is surprisingly large, and might be obviated by establishing well-considered rules dealing with its storage, transportation, and thawing. No contracts for *frozen undressed fowl* should be made, as such food is a menace to health.

c. Mess gear and some articles of ship equipment: (1) Mess gear.—The enamel ware now in use is far from satisfactory, largely by reason of chipping, and persistent efforts should be made to find a substitute in some metal applicable to this use. Certain articles are of a *shape* that renders them extremely difficult to clean, notably the syrup jug, coffee pot, and butter dish, and more suitable designs should be adopted. A *food carrier* on the general plan of those formed by superimposed sections with close-fitting edges held in place by perpendicular straps is needed, and could be readily adapted to the present style of pan used for distributing food to the mess tables. It is urged that all *mess gear be boiled* in the washing machine at least once a day. The urgent necessity for substituting a *metal meat tub* for the present wooden type is realized, and the change can not be made too promptly.

(2) The utilization of metal *spit kits*, which has already been inaugurated, is a step in advance, and the old style should soon disappear entirely.

d. Methods of cleaning: The present methods of cleaning, when applied to compartments and rooms, are insanitary, laborious and waste much valuable time which might well be devoted to other important duties bearing upon military efficiency. *Vacuum cleaners* installed in all vessels, barracks, and offices would do away with these objections and produce a more thorough result. "*Swabs*," as used, are a menace to health, and their employment detracts from rather than adds to cleanliness. If used, they should be thoroughly boiled out in lye water three times a week.

e. Clothing: Under existing conditions there is no proper provision for the protection of the personnel when campaigning in northern latitudes in the winter season. Likewise, there are certain articles of clothing authorized for tropical service which are manifestly unfitted for those climatic conditions. The attainment of the highest degree of simplicity and serviceability, with due regard for adaptability to climatic and other hygienic and sanitary conditions, requires

the most careful study, and it is urged that a special board be appointed to investigate and report upon this subject.

f. Barber shops: Improvement in conditions surrounding this fertile source of disease has been marked in certain vessels and stations, and there is a general tendency toward betterment throughout the service. The ends desired would be attained more rapidly and more certainly if a policy were inaugurated to definitely set aside a room for this purpose only, to be furnished and equipped by the department in such manner as to meet the requirements of the most advanced city ordinances, and the bureau urges that such a plan be adopted and put into effect.

C. SPECIAL HYGIENIC AND SANITARY FEATURES.

1. *Relative to general infective, venereal, and other diseases.*—a. *Tuberculosis*: A determined campaign against this disease has been undertaken. Special effort is made to eliminate incipient cases and those showing predisposition at the recruiting stations, recruiting depots, and detention barracks; also to detect cases developing among the personnel at the earliest possible moment with a view to the immediate adoption of precautionary measures and the ultimate elimination of these patients from active service. Warnings and instructions have been promulgated verbally and by circulars, and in Guam and Samoa particular efforts toward limiting the ravages of this disease among the native population have been made.

b. Typhoid fever: *Prophylaxis by inoculation.*—The compulsory use of typhoid prophylactic was inaugurated January 1, 1912, and the inoculation of practically the entire naval personnel has been completed without a single serious result or casualty. Only a small fraction of 1 per cent had reactions necessitating rest in bed, and but a small percentage of individuals required to be excused from duty. As this policy has been put into effect so recently, it is impracticable to formulate any comparative data relative to the rate of the disease, but reports, made in response to a bureau circular letter, show that, in men who had received the three injections, only one authentic case of typhoid has occurred, although three were reported as such in which laboratory findings failed to verify the diagnosis. One mild case occurred in a man who had had but two inoculations. One officer, known to be a typhoid carrier, was found to be free of the typhoid bacillus subsequent to receiving the three injections required. The prophylactic administered to the personnel on the Asiatic station was prepared at the naval hospital, Cañacao, P. I. The adoption of the most recent advances in *diet* has materially reduced the convalescent period of typhoid patients, and the sporadic cases that may occur in the future will resume their duties more promptly. Its prevalence in the towns near one of the training stations has made it necessary to take special precautions at that place, and it is reported that one of the large ports of the United States, formerly remarkably free from it, now has a high rate of infection, and we must therefore consider this city among the "typhoid ports." The recent outbreak at the training station, Norfolk, Va., was considered to be due to unsatisfactory conditions existing both on the station and in the near-by towns, and this decision has led to a most commendable effort on the part of the municipal authorities toward their correction, a movement which has

been met by the active cooperation of the medical officers of the Navy, and already shows most promising results. The epidemic on the *West Virginia* was considered to have resulted from the presence of a typhoid carrier, associated with the overflowing of the crew's head and the prevalence of flies. A possible source of infection at Guantanamo, Cuba, is swimming at Hicacal Beach, which practice should be discontinued. It is necessary to make special effort to prevent the importation of typhoid into Guam and to limit its spread in Tutuila, Samoa, where it has so recently appeared.

c. Epidemic cerebrospinal meningitis: Antiseptic nasal douching of newly arrived recruits has been employed at a certain naval training station in an effort to limit the number of infections with this disease.

d. Gangosa: Segregation is practiced, coupled with instruction relative to the necessity for cleanliness, isolation, and the reporting of cases. and the use of mercury, iodine, and salvarsan in the treatment of this condition has resulted in a material improvement in the situation.

e. Leprosy: Segregation is strictly carried out and instruction is given relative to the necessity for cleanliness, the destruction of bedbugs and the isolation and reporting of cases. All lepers at Guam have been transferred to the colony at Culion, P. I., and cases developing subsequently will be similarly deported.

f. Plague: For vessels cruising in the waters of plague-infected countries a fuller realization of the importance of rat guards and other precautionary measures and the promulgation of rules regarding them are needed. This is particularly important in view of the recent outbreaks of this disease at Habana, Cuba, and San Juan, P. R.

g. Contagious diseases: The training stations both on the east and west coasts are a menace to the efficiency of the personnel afloat owing to the more than occasional transfer, to ships, of men with certain of these diseases in the incubation stage. Time and expense would be saved if all drafts were isolated the required period prior to sending them to sea.

h. Intestinal parasites and gastrointestinal disorders: Since examination has shown a suprisingly high incidence of hookworm among the naval personnel, especially in men from the southern part of the United States, the routine examination and treatment of recruits from this source is advisable. Quarterly compulsory examinations and treatment for intestinal parasites in the naval personnel and natives of Guam have been established, and limitation of numbers in the medical department alone prevents the inauguration of a like measure in Samoa. A marked reduction in the morbidity resulting from gastrointestinal disorders has been obtained among midshipmen by the establishment of the Naval Academy dairy.

i. Insect-borne diseases: (1) Campaign against the fly: The following circular letter was sent to all medical officers, and since its issue many requests for copies have been received from various outside sources.

The following facts in connection with the life history of the house fly (*Musca domestica*) will be of value in the adoption of measures for the prevention of the development of these dangerous pests.

Of all material which is favorable for the breeding of flies, horse manure, especially when fermenting, has the first place. This fermentation process goes on best when the

manure is piled up in heaps. Other favorable breeding media are found in poultry yards, pig pens, and even in heaped up masses of waste paper or old rags. Vegetable refuse as found in garbage is also a medium of importance. Cow manure is not a favorable medium, probably due to the excessive amount of moisture it contains. Very dry or very wet manure is not liable to breed flies. Last, and most important from the standpoint of transmission of typhoid fever, dysentery, and cholera, is human excrement. When privy systems are in use the utmost care by screening should be taken to avoid access of flies to the fecal material.

The fly eggs are usually deposited in crevices near the surface of the manure or refuse heap, and the larvæ hatch out in from 1 to 3 days. The period may be as short as 12 hours. The larvae or maggots mature under the most favorable circumstances in from 5 to 8 days. If conditions are not favorable for fermentation the period may be lengthened to a month, or longer. The pupal stage is passed through in from 5 to 7 days when conditions are favorable. From the above it will be seen that under favorable conditions flies may develop in from 10 days to 2 weeks.

Of foods liable to be dangerously contaminated by flies carrying the germs of typhoid, dysentery, or cholera, milk is easily the first. The danger of infection from meat or vegetables contaminated by flies is of less degree.

Flies probably do not fly more than 200 yards, but they may be blown by winds for considerable distances, in all probability for 1 or 2 miles. They rarely will be found to fly higher than 75 feet.

The following measures are accepted as the most practical for the handling of the fly problem during the season of their development (Apr. 1 to Dec. 1 in this latitude):

1. Thorough screening of all places in which food is prepared or served.
2. All manure from stables, poultry yards, etc., should be removed at least once a week and buried in pits covered with soil, or placed in screened receptacles.
3. The greatest care should be taken of the garbage, and garbage fly traps for garbage cans are to be recommended.
4. For the capturing of flies, large traps 2 to 3 feet square, made of wire-screen sides, with entrance of the character used in the smaller fly traps, will give the best results when flies are very numerous. A very satisfactory bait is cane sugar syrup worked up in bread.
5. Under no circumstances should manure be heaped up in piles about gardens. The manure should be brought from its screened receptacle or soil-covered pit in quantities sufficient for immediate use, and worked into the garden soil and covered by the soil as soon as possible.

The danger, as stated above, from very dry or very wet manure when scattered over a surface is probably slight.

It is to be remembered that flies breeding on adjacent premises may (possibly at a distance of a mile) make the measures adopted apparently failures.

Weak *formalin* solution has been found to be the best and most universally available poison, while in Guam, arrangements have been completed for the introduction of the fly parasite, *spalangia cameroni*. The *screening* of all sick bays, galleys, mess halls, and exposed food is rapidly advancing, and all heads and toilets should be similarly treated.

(2) *Campaign against the mosquito.*—Screening, mosquito nets, draining, clearing, oiling and the use of larvacides, and restriction of liberty to daylight hours are well established principles in infected districts. When the possibility of an epidemic of *yellow fever* threatened Honolulu, the personnel of the Marine Corps rendered valuable aid to the municipal authorities in carrying out preventive measures. The recent epidemic of yellow fever on the *Yorktown*, although throwing grave and urgent responsibilities upon the Medical Department, was promptly controlled by proper sanitary methods, thus enabling the vessel to remain in waters where military necessity demanded her presence. When vessels are in ports in which mosquito borne diseases prevail, the *canopies of launches* should be thoroughly brushed out on each return trip from shore, in addition to other recognized precautions.

j. Venereal diseases: The present system of *prophylaxis* is not entirely satisfactory and the results are disappointing, but the im-

provement noted is sufficient to warrant its continuance and should lead to greater effort. Delay in obtaining treatment, personal equation of patients and medical officers, and improper use of calomel enter into the failure to reduce the morbidity to as great an extent as expected. The element of time is of great importance, as there was a markedly lower percentage of failures of prophylaxis among those receiving it before 18 hours had elapsed after exposure than in those taking the treatment subsequent to that time. Furthermore, the reports from vessels and stations where prophylaxis has been voluntary do not show as much improvement as those from vessels and stations where the treatment was compulsory. The majority of medical officers have recommended the substitution of the venereal packet for the present method, but there is reason to believe that this method is open to even more objections than the one now in use. Treatment for those who return from liberty within 18 hours after exposure and packets for those going on extended liberty would undoubtedly result in greater benefit.

Salvarsan as a treatment for syphilis will undoubtedly diminish the time lost to the service by reason of this disease, and, furthermore, it has rendered such cases far less of a menace to their associates. The discrepancy between the first part of this statement and the figures shown in the statistical tables is only an apparent one, and is due to the present custom of sending all cases of syphilis to the hospitals for the purpose of receiving the injections of salvarsan and of keeping them there one month for observation, whereas formerly such individuals were merely entered for record, and the long period during which they were receiving treatment failed to appear among the sick days. The general issue of this drug to ships, although it would result in a still greater saving of time, is a questionable expedient.

k. Mental diseases.—More thorough and painstaking examinations and more intimate knowledge of psychology on the part of recruiting officers, the study of the temperamental qualifications of applicants for certain ratings, and the more general application of healthful exercises and recreation will undoubtedly reduce the damage to the service from these affections.

2. *Relative to occupational diseases and injuries.*—a. Eye strain in gun pointers and those who use the periscope: Careful original selection is practiced and periodic examination of vision should be made, followed up by intraocular examinations by an expert in those cases where the vision is found to have fallen below eighteen-twentieths.

b. Injury to ears from gunfire: Many appliances for the protection of the ear against this source of injury have been submitted and examined, and practical tests of some of these have been carried out in two fleets, but a device complying with all requirements has not yet been found. Thus far the Frank ear stopple has proven the most satisfactory, although there has not yet been opportunity for a thorough trial of the new type of Elliott ear protector.

c. Injuries resulting from artificial illumination: Much has been accomplished toward improving the illumination on the vessels of our Navy, but it is still in a most unsatisfactory state, and additional investigation of this subject is desirable. Injury resulting from *searchlights* has been largely remedied by the use of electrician's glass to eliminate the ill effects of intensity and "Hallauer" glass to absorb the actinic rays, and the use of such glasses should be compulsory.

Better facilities for reading and studying have been provided for the enlisted personnel, but they are still far from satisfactory. In many instances the glare of *white interior* decorations has been relieved by proper tinting of bulkheads.

d. Drowning: Through the inauguration of *compulsory swimming exercises* and the establishment of a required standard, the health of the personnel has been benefited, and the death rate from drowning will be reduced. Great moral support resulted to this movement by the withholding of commissions of certain midshipmen who failed to meet the requirement. Types of apparatus for the *resuscitation of the apparently drowned* or those overcome by noxious gases have been investigated and one is being given a trial on the hospital ship *Solace*. Since they will undoubtedly aid in reducing the mortality from this condition, their issue to all submarine tenders and to one ship in each division will be undertaken.

e. Lead poisoning: A campaign to reduce the incidence of lead poisoning, both among the personnel of the Navy and the civilian employees of the department who are exposed, has been inaugurated, and the following circular letter has been issued to all medical officers:

The bureau desires to have the question of lead poisoning among the personnel on shipboard and at navy yards given careful investigation. It is therefore requested that particular care be taken to determine the existence of such cases and that a full report be submitted in each instance, indicating the probable mode of lead absorption, symptoms, course, and termination, with recommendations regarding the adoption of appropriate preventive measures. Particular attention is invited to an article in the April issue of the Naval Medical Bulletin by Medical Inspector E. R. Stitt, United States Navy, regarding lead poisoning through the inhalation of red-lead-laden dust.

The following data are pertinent to the investigation of this subject:

Lead poisoning in persons in the Navy may be brought about in the following ways:

1. Ingestion of lead as the result of taking food without properly washing the hands and face after painting.

2. By inhalation of lead-laden dust in compartments where lead dust is present as a result of chipping old lead paint or otherwise. This dust may also be swallowed in the saliva or at the time of eating or drinking.

3. By solution in the sweat of red or white lead deposited on the skin and subsequent absorption through the skin. Lead absorption by this method is of slight practical importance.

4. Methods of poisoning by lead through drinking water or in coloring matter in food are of less importance in the naval service than in civil life.

There are four chief types of lead poisoning: (1) Lead colic; (2) lead encephalopathy, in which the central nervous system is prominently effected; (3) the peripheral neuritis type, as shown in "wrist drop"; and (4) lead cachexia.

If the period during which the lead poisoning has taken place be short, the manifestations are chiefly those of colic or lead encephalopathy. In the diagnosis of lead poisoning, the blue line on the gums is the most constant and easily observed sign. The value of this sign is chiefly negative, as probably more than one-half of those working in lead but not having lead poisoning show it. The typical blue line is on the gums, commencing at the tooth margin. Associated with this lead line, in cases of poisoning, will probably be found anemia, loss of appetite, metallic taste, foul breath, and spots before the eyes. Headache is often a prominent feature of lead poisoning. A tendency to nausea, with a sense of weariness, is suggestive.

With lead colic, the pain tends to center at the navel, but may be complained of in the region of the appendix. The patients are very restless and tend to roll about. The pulse is slow, small, and of high tension. Constipation is the rule, and its relief may relieve the colic.

In lead neuritis, the wrist drop is usually preceded by pain or numbness of the muscles of the forearm. It is usually bilateral, but the extent of the involvement on the two sides varies. In lead encephalopathy, epileptiform seizures are the most common manifestation. Workers in lead who give absolutely no signs of lead poisoning may show as much as three parts per million of lead in the urine. This finding, like the lead line, is more confirmatory than diagnostic. A simple test for lead in the urine is that

described by von Jaksch: Place a strip of bright magnesium ribbon in about 300 c. c. of urine and add 2 grams of ammonium oxalate. After 2 to 12 hours remove the magnesium strip, wash in distilled water, and dry it. Next warm the strip with a crystal of iodine in a watch glass over a low flame. The formation of the yellow iodide shows that lead has been deposited on the magnesium strip. It will show one part in 50,000 of urine. (Considerable experience with this test is necessary for a proper interpretation of the findings.) A more satisfactory test is to dissolve the magnesium strip with the lead deposit in a very few drops of nitric acid. Then make alkaline with soda solution. Next add acetic acid, drop by drop, until the solution is perfectly clear. Finally add a few drops of a solution of potassium chromate, or bichromate, and note the formation of a yellow precipitate of lead chromate. For the detection of minute quantities of lead, more exact methods are necessary, involving concentration, destruction of organic matter, and electrolysis. Such methods, however, are difficult of application.

As regards the value of punctate basophilia in the diagonsis of lead poisoning, Sir Thomas Oliver considers it of value, but unreliable, he having found the sign negative in 40 per cent of his cases of plumbism. For this test, make a uniform smear on a slide and stain according to the Giemsa or Wright method. Blue dots in the red cells show punctate basophilia. The blue dots in lead poisoning seem larger and more splotchy than those usually observed in secondary anemias for malaria or infection with animal parasites.

Prophylaxis.—Men working in compartments containing lead-laden dust should wear some type of respiratory mask, and care should be taken that they do not become fatigued, a condition which predisposes to lead poisoning. Alcoholics are particularly susceptible to lead poisoning, and in particular to lead encephalopathy. In all forms of employment with lead a full meal should always be taken before commencing work. Thorough washing of hands and face before eating should be insisted upon, as well as bathing of the entire body daily. Chewing of tobacco while working with lead should de prohibited. The taking of tablets of sodium hyposulphite is to be recommended during the continuance of work with lead. About five 5-gram tablets may be taken baily. The wearing of gloves during the process of handling, grinding, or mixing lead paints is of great value in preventing poisoning. Clothing that is tight fitting at wrists and neck affords additional protection; cuts and abrasions should be protected until healed. When a workman complains of symptoms of lead poisoning, he should be directed to report to the surgeon for observation, and should the diagnosis be affirmative he should be removed from further contact with the source of poisoning.

As regards treatment, it should always be borne in mind that potassium iodide should be used with caution in cases of acute poisoning, as lead deposited in the tissues may be redissolved and intensify the existing condition.

f. Injurious effects of duty on submarines: (1) Investigation of air.—The work of the board established for this purpose is partially completed, a preliminary report has been submitted, and the final report is expected in the near future. It is already apparent that this exhaustive investigation will be of great value to the service. (2) The *crews* of these vessels should be carefully selected, far more attention being paid to their physical condition and temperamental make-up. (3) The disposal of *waste* and the *inadequacy of heating* are subjects which require further study.

g. Accidents involving the rescue of personnel from compartments filled with steam or noxious gases: Types of oxygen rescue apparatus have been tentatively studied and it is urged that they be further investigated with a view to obtaining a form adaptable to use on board ship. After rescue, the resuscitation apparatus, previously mentioned, would be of inestimable value.

h. Caisson disease in divers: Since many mild and a few severe cases of this disease have been reported it is urgent that all divers and their assistants be instructed in the method of decompression ascent.

i. Conditions in fire and engine rooms: From the investigation of this subject inaugurated in connection with the speed trials and endurance runs the following conclusions are drawn: (1) The *cubic air space per man* is ample, but the necessity for greater circulation of air is very evident. (2) The *ventilation* is only fair, although it has been

markedly improved on certain vessels. (3) The *relative humidity* is high in the engine rooms, but low in the firerooms. (4) Contamination with *noxious gases* other than CO_2 was not observed, but reduction in oxygen was considered marked. (5) The majority of the fireroom force complied with the *physical requirements*, but the standard is too low, the greatest deficiencies having been found among the coal passers. (6) *Heat exhaustion* was not so prevalent as *heat cramps*, but diseased conditions predisposed to both. The quantity of fluid imbibed apparently had no influence upon these conditions, but the number of cases of heat cramps was increased when fluids of low temperature were consumed. The addition of ginger to the drinking water apparently diminished the number of these cases. (7) The temperature of both fire and engine rooms was much lower than that of the adjacent compartments. (8) *Suspension of artificial ventilation*, except for brief periods, would be impossible.

j. Expeditions and landing forces: The recent expeditions of marines and naval landing forces have been accomplished with an exceptionally low morbidity rate, due to the well-directed sanitary measures of the medical officers, the able support rendered them by the officers in command of the various expeditions, and the excellent organization of the hospital corpsmen. One of the most difficult features to cope with has been the proper protection of the large detachments of marines hastily placed upon inadequate transports, with the resulting overcrowding, exposure, and lack of proper living accommodations. Since these sudden and unexpected calls for the transportation of large bodies of men from the naval service must be anticipated, it is imperative that properly equipped vessels of ample proportions be provided in order that the personnel may reach their field of military activity in the most efficient physical condition. The use of *iodine* in military surgery is a distinct advance, and new types of *expeditionary medical and surgical cases* have recently undergone trials with the marines in Cuba.

k. Temperamental fitness: The bureau is engaged in developing methods for determining the temperamental qualifications of officers, midshipmen, and enlisted men, in order that those who are thereby rendered unfit for the service may be weeded out or prevented from entering, if possible. Certain individuals appear physically sound whose temperaments are such that they do not meet the requirements of the Navy, and it is useless to attempt to overcome these shortcomings.

l. General improvements: The sanitary conditions surrounding the civilians employed in the *foundry at the Washington Navy Yard* have been found to be unsatisfactory and steps have been taken to erect a new and modern building. The lack of ventilation existing in the *acid room* at the navy yard, Puget Sound, has been rectified.

D. NAVAL ATHLETICS AND PHYSICAL TRAINING.

A further study of the effects of spectacular athletics on the personnel of the Navy, and particularly on graduates of the Naval Academy, supports my attitude in this important matter as made known to you in previous reports. If, in gunmaking, we found we could employ a process of manufacture which would yield a gun that gave us conspicuous excellence at the first battle practice, but which was followed by signs of undue deterioration afterwards, we would cast aside such

a process and seek one that would produce more enduring qualities—one likely to turn out a gun that would give a good account of itself in actual warfare—for which it was really intended.

So it is with the units of personnel that come out of the Naval Academy. If high specialization in athletics at the Naval Academy by a small group of men each year leads to an undue proportion of disability in this "twice-picked" group afterwards, then it is a matter for serious consideration, aside from the tendency of those not athletically inclined to stagnate on the side lines. It is desirable to develop the kind of courage that leads to victory as well as the kind of courage that bears defeat manfully. Service conditions attend to this feature of the development of officers afterwards. The immediate hazards of sport are inconsequential as compared with the future effects of overtraining and overstraining for brief periods, to be followed by years of relative physical quietude. The records naturally fail to take into account those whose physical disabilities are of such a character as not to cause their admission to the sick list, yet whose efficiency has been impaired by them. There are many such officers in the service who consult medical officers for cardiac irregularities, obesity, or physical staleness—in other words, for conditions that it appears reasonable to attribute to overtraining and overstraining followed by periods of physical quietude exacted by service conditions. These cases do not become matters of record unless they are of such moment as to render the officers wholly unfit for duty, yet such influences in many instances materially affect the military efficiency of the individual and should be averted if possible.

In my opinion professional coaches should not be employed at the Naval Academy. Physical training and athletics should be so tempered as to be beneficial to all. They should produce a supple, agile, all-around well-developed individual, not a muscle-bound mass of brawn. The man who steps out of a boat, comes off the football field, or leaves the track should feel exhilarated by his exercise. Is it logical to suppose that the man who is lifted out of a boat, collapsed, or is carried off a football field or track in the same condition is not harmed thereby? Physical training and athletics should be under the direction of a properly qualified medical officer, who would be able to avert the harmful effects of abused athleticism, and who would be properly qualified to institute exercises beneficial in character. Those who have not been trained in anatomy, physiology, and pathology as well are not qualified to direct these exercises.

In studying naval statistics it must be borne in mind that midshipmen are carefully selected at the outset on the score of their physical makeup; in other words, they are picked men, while the athletic stars, we might say, are twice-selected picked men. They are the men, it would be reasonable to suppose, who would be best able to resist the ill effects of overtraining and overstraining, and who should, other conditions being equal, possess a comparatively greater expectation of health and longevity.

Twenty years ago the mad rush for athletic excellence had not reached its present pace; consequently, as sufficient time has not elapsed, we are not able to say definitely what the future has in store for this group. It might be well for athletic directors to point out to those who aspire to enter the mad race for lowering athletic records the penalty that will be likely to come in later years.

In previous reports to the department, the bureau has given at some length its attitude in regard to this subject. Included in these reports were certain data obtained from an examination of the medical records of 622 star, or specialized, athletes of the classes of 1892 to 1911, inclusive, at the Naval Academy, for the purpose of ascertaining the incidence of certain disabilities or abnormal physical conditions among them. These data and the opinion expressed by the bureau relative to the inadvisability of high specialization in service athletics, particularly at the Naval Academy, have aroused such interest both within and without the service that this examination has been extended to include a similar inquiry into the records of 580 of the nonathletic midshipmen, covering the same period of time. This was undertaken not so much in the expectation that the physiological question involved is susceptible at present of being answered definitely by mathematics alone as in response to a general request for further information. Given an equal number of specialized and nonspecialized athletes recruited from individuals of similar physique, subjected to a continuous system of training through a given period, a comparison of the two groups in reference to their morbidity and mortality would be of marked statistical value.

The result of the examination of the records of 580 nonathletes shows 22 casualties (retirements and deaths) as compared with 21 casualties for the athletes, derived from the examination of 625 records, which shows that, despite the handicap in regard to supposedly better physical material, the casualty list for the athletes about equals that of the nonathletes. Further, it has been found that from those diseases selected to which athletics have a possible or probable causative relation, there has been but 1 death among nonathletes as compared with 6 for the athletic group. The number still in the service whose medical records show the listed abnormal physical conditions is 187 for the nonathletes as against 198 for the athletes. The following conditions or disabilities show an excess amounting to 50 per cent or more among the athletes: Arteriosclerosis, valvular disease of the heart, cardiac irregularity, cardiac dilatation, cardiac hypertrophy, gastric disturbances, albuminuria, general poor health, obesity, and tuberculosis, and various traumatic lesions as well. It seems reasonable to suppose that the disabilities among the athletic class are largely due to spectacular athleticism and would not have been acquired had the overstraining and overtraining not been indulged in.

It is therefore recommended that athletics in the Navy be so regulated as to avoid these deleterious conditions by the prohibition of endurance contests where the ability to win is largely, if not entirely, dependent upon brute force, and that rather the maximum effort be made to develop a symmetrical, normal physique in the many instead of a highly specialized human machine in a few. The adoption of the Swedish system of physical training is earnestly recommended for use not only at the Naval Academy, but throughout the entire service, as its effectiveness has been demonstrated not only at the Naval Academy during the past year, but in the Marine Corps at those stations where it has been employed. This system of physical training leads to a well rounded out development, alertness, and agility, particularly desirable in a naval military organization. Since the system was put into use at the Naval Academy, the pre-

vious tendency of the first and second classes of midshipmen to retrograde in strength and weight has not only been checked, but an actual gain has been made. There has also been an improvement in the average weight and strength of the lower classes. These notable advances indicate that the trend of physical training at the academy is in the right direction—i. e., the muscular development of the entire personnel to a higher but rational standard, rather than the production, from material already fit, of a comparatively few specialists, which from a service utilitarian point is useless, if not actually harmful.

Section II.—*Operations.*

I. POLICIES.

A. ESTABLISHED.

1. *Educational.*—a. Naval Medical School: This institution proves of increasing value to the service, not only in rounding out the practical education of medical officers recently admitted to the corps, but also by performing expert laboratory examinations, by carrying on research work, and by developing laboratory methods adapted to the peculiar conditions found in the Navy. In addition, a valuable collection of pathological, helminthological, and miscellaneous specimens is being accumulated and classified, and the large library of bound volumes and current literature is being carefully indexed. Only seven assistant surgeons were graduated in April of this year, and there are only seven in the present class, although there are 53 vacancies in the corps (November 15, 1912). It was with regret that the spring course, devoted to the instruction of officers of higher rank, had to be abandoned again, owing to the deplorable shortage and the increasing demands of the service at large.

b. Medical and surgical conferences in the Atlantic Fleet: The conferences of the medical officers of the Atlantic Fleet were an interesting and valuable feature of the winter mobilization at Guantanamo Bay, Cuba. Between January 14 and March 14, 1912, eight meetings were held, with an average attendance of 20 medical officers. A number of valuable and instructive papers were read and discussed, some of which have been published in the Naval Medical Bulletin with a view of making these important matters more generally available.

c. Instruction of medical officers of the Naval Militia: This summer (1912), for the first time in the history of the Navy, a member of the Medical Corps was specially assigned to the duty of instructing medical officers of the Naval Militia in naval customs and methods during their practice cruises. It is the intention to assign a medical officer in the bureau to the additional duty of corresponding with the medical officers of this branch of the service, in order that they may be kept informed of the routine and usages of the corps and to supply them with available literature, so that they may be in closer touch with the regular Naval Establishment and more fully cognizant of their duties in time of war.

d. First-aid instruction of enlisted men by divisional officers: The establishment of this system is a marked advance and the benefit derived therefrom would have been more pronounced had officers

fully appreciated its intent and the improved military efficiency which would result. It is reported that in the case of one ship of the battle fleet this drill was not carried out. In order to establish a definite and uniform method, a brief pamphlet on first aid is being prepared for the use of divisional officers. Moving-picture films depicting the actual application of first aid are also in the course of preparation and will prove of great value in furthering this necessary instruction.

e. Training of Hospital Corps men on board ship: Systematic and uniform instruction, beginning on shipboard and continued along more practical lines at hospitals, has been consistently carried out, and the plan has demonstrated its value. It is of particular benefit to hospitals, where the majority of patients need the care of experienced men. In order to bring it to a higher state of efficiency, a text-book for the Hospital Corps of the Navy is to be prepared, and medical officers will be required to make regular reports on the progress of each man.

f. Training of native nurses, Guam: Members of the Navy Nurse Corps are giving instruction to certain Chamorro women who show aptitude, with a view to establishing a corps of trained nurses for native patients. These commendable efforts have met with success, and additional nurses have been assigned to this station in order that the work may be extended.

g. Instruction in hygiene for the rising generation of Chamorros: An elementary course in hygiene and sanitation has been introduced into the curriculum of the common schools of Guam.

h. Medical circulating library: This feature of medical education, established on the hospital ship *Solace*, has proven of great value to the medical officers of the Atlantic Fleet.

i. Open-shelf library: This system has worked admirably on the hospital ship *Solace*, with very trifling losses. It would be a distinct advance if established on all vessels.

2. *Economical.*—a. New accounting system for hospitals: This plan has for its object the establishment of a definite and uniform system of accounting, an accurate classification of expenditures, and an authoritative record of current expenses and permanent construction. Certain new forms have been instituted, e. g., bill book, commissary ledger, receipt and expenditure voucher, and ration record, which replace the old order book and all other forms previously used in this connection.

b. New bureau forms and methods: (1) Statistical—(*a*) A sheet form for returns of enlistments and admissions to the service (abolishes Form X card). (*b*) A card form for combining detailed, quarterly statistical reports, relative to diseases and injuries, from individual hospitals, ships, and stations. (*c*) A sheet form for combining all statistical reports by diseases and injuries. (*d*) Graphic statistical charts of all important or prevalent diseases kept up to date. (*e*) A system has been established whereby an accurate record is kept of all sick days resulting both from admissions of naval personnel to hospitals other than naval hospitals, and from sick leave. (*f*) The report of medical survey has been rearranged and simplified.

(2) Records of personnel—(*a*) Medical officers. The Rand adjustable index, a system of loose slips forming panels arranged in book form, has been substituted for the old card index for keeping the

temporary record of ever-changing duties and stations. (*b*) Hospital Corps men. In the future the duty of attending to these records will be performed by a medical officer.

c. Naval insane: Hereafter, in appropriate cases, insane patients *during transportation* will be accompanied by a hospital steward and such attendants as may be necessary. Doubtful and obscure cases will be sent to the naval hospitals at Cañacao, P. I., or Washington, D. C., where special *psychopathic wards* have been established for the purpose of treatment and the application of expert diagnostic methods. All cases in which there is good evidence that the disease or a predisposition thereto existed prior to enlistment are surveyed and *discharged from the naval service* soon after their commitment to the Government Hospital for the Insane, Washington, D. C.

d. Abandonment of naval hospitals: (1) Washington, D. C.—By reason of the completion of the new hospital and the uselessness of the old one, the latter was abandoned May 26, 1911. Since that time an effort has been made to sell both building and property, but the necessary legislative authority has not as yet been obtained.

(2) Puget Sound, Wash.—The old building formerly used as naval hospital and yard dispensary was abandoned for hospital purposes February 2, 1912, upon completion of the new hospital.

(3) The naval hospitals at Pensacola, Fla., San Juan, P. R., and Sitka, Alaska, were all abandoned during the year by order of the Navy Department.

e. Inspections of hospitals and of medical departments at navy yards and stations: These inspections, made by the Surgeon General at various times during the year, were of inestimable value in gaining accurate information whereby the affairs of these institutions could be more efficiently directed.

3. *General.* a. Liability act of May 30, 1908: The first aid administered and house visits required under this act have again made great demands upon the medical departments of the navy yards, necessitating the detail of two medical officers to these stations.

b. Division surgeon: The assignments of medical officers to the Atlantic Fleet have been so arranged as to place the senior of each division on the flagship, and, as their duties simulate those of the fleet surgeon, these officers should exercise more active supervision of the affairs of the group of vessels to which they are detailed.

c. Analytical chemical laboratory on hospital ship *Solace:* For the purpose of making chemical examinations of any material submitted, but more particularly for the testing of food supplies for adulterants and preservatives, an elaborately equipped chemical laboratory has been established on the hospital ship *Solace,* with an expert chemist in immediate charge.

d. Marine detachments at naval hospitals: The establishment of this policy has proven most beneficial, and efforts are being made to enhance the comfort of and better the hygienic conditions surrounding the personnel composing these guards.

e. Strong wards in naval hospitals: Most of the hospitals are now fitted with strong wards for the care of court-martial prisoners and mental defectives, and all will be so provided in the near future.

f. Attendance upon families by medical officers: This practice has grown enormously at some stations and is encouraged by the bureau

in that it is helpful to medical officers professionally and gives efficient medical and surgical attendance to the families of officers, bringing, as well, the different branches of the service into closer touch with the Medical Corps. There has been a good deal of abuse of this service and a lack of consideration in some instances. The bureau has under consideration the establishment of two wards for women and children, one on the Pacific coast and one on the Atlantic, where the families of officers can be cared for in surgical crises.

g. Outfits on ships in reserve: Formerly the medical outfit of a ship placed in reserve was transferred to another vessel going into full commission. The present arrangement of keeping many vessels in reserve, fully equipped for instant use, renders this plan impracticable, and a heavy expense has been incurred as a result, by reason of the necessity for leaving the outfits on board such ships. This policy, put into effect soon after the establishment of the reserve fleets, has since become mandatory by reason of a recent general order.

h. Entries "not in line of duty" on health records: The regulation requiring that medical officers enter on the health record the statement of the individual concerned, when an entry is made "not in the line of duty," is eminently just and fair, and the medical officers are conscientiously following out this order.

B. INAUGURATED, BUT NOT ESTABLISHED.

1. *Educational.*—Revision of the Instructions for Medical Officers, to be called in the future the Manual for the Medical Department, has been taken up and will be rapidly completed subsequent to the issue of the new Navy Regulations.

2. *Economical.*—a. Naval dispensary, Washington, D. C.: The change in location and organization of this dispensary will be completed in the near future, thereby making it more central and convenient and doing away with the necessity for two dispensaries. A large, well suited building, which will be arranged to meet the requirements most satisfactorily, has been selected and will be devoted to this purpose only. The equipment will be modern in every way, and provisions will be made to deal with cases suffering from the special diseases as well as for the large general dispensary practice.

b. New bureau forms and methods: (1) Statistical.—(*a*) The nomenclature of diseases and injuries used in the Navy will in the future conform to the Bellevue Nomenclature. (*b*) A form for the quarterly return of patients on the loose-leaf system will soon replace the former quarterly statistical report. (*c*) A new form for reporting operations has replaced the former report by a much simpler and more valuable return.

(2) Administration of hospitals: More systematic and complete regulations for the internal administration of hospitals have been completed and will be submitted to the department in the near future.

C. CONTEMPLATED.

1. *Educational.*—a. Medical and surgical conferences in the Pacific and Asiatic Fleets and at the larger shore stations would prove of great interest and value, and medical officers should actively cooperate in the attainment of this end.

b. Instruction of medical officers: (1) It is urged that medical officers of the Atlantic Fleet be detailed, from time to time, for temporary duty on the hospital ship. Such assignments, lasting about two weeks, would afford valuable opportunity for clinical and laboratory work otherwise unobtainable during a cruise. (2) The success attending the development of the laboratory work, in connection with the course in tropical medicine at the Naval Medical School, has led to a decision to institute practical instruction in physical diagnosis, thus largely replacing the former method of didactic lectures.

c. Laboratory instruction for Hospital Corps: Certain members of the Hospital Corps, selected for special aptitude, are to receive a course in laboratory methods at the Naval Medical School, and they will subsequently continue this work at the large hospitals.

d. Training native nurses, Tutuila, Samoa: A system of training Samoan women for the duties of nurse should be established at Tutuila, similar to that now in existence at Guam, and the assignment of members of the Navy Nurse Corps to this station will make this practicable.

e. Instruction of the rising generation of Samoans in matters pertaining to health by the introduction of an elementary course in hygiene and sanitation into the curriculum of the common schools of Tutuila, Samoa, should be put into effect.

2. *Economical.*—a. New bureau forms and methods: Revision of the Medical Supply Table.—A thorough revision of the supply table will be undertaken in the near future, and already much preliminary work has been accomplished in the revision of Form B (requisition form) which is based upon this table.

b. Abandonment of naval hospitals: Olongapo, P. I.: By reason of rapid deterioration and excessive expense involved in repairs, it will become necessary to abandon the station hospital (formerly the hospital ship *Relief*) within the next few years.

c. Field tourniquet: This type of tourniquet will not be issued in future. It is difficult of adjustment and, improperly applied, is not only useless, but harmful.

3. *General.*—Embalming of naval dead at sea: Provisions should be made for embalming the bodies of those who die at sea, the procedure being carried out by Hospital Corps men under the guidance of a medical officer. Caskets and other necessary equipment will be provided on the bureau supply table as soon as funds are available to carry this measure into effect.

II. CONSTRUCTION.

All extensive new construction under the Bureau of Medicine and Surgery will be suspended until specific appropriations are provided by act of Congress, as the naval hospital fund is now fully obligated. However, certain new buildings were considered of such immediate necessity that the bureau has undertaken them at once, namely: (1) Temporary heating plants for the preservation of the hospital buildings at Chelsea, Mass., and Newport, R. I.; (2) contagious-disease buildings at the hospitals at Great Lakes, Ill., and Puget Sound, Wash.; (3) stable and garage at the hospital, Great Lakes, Ill. In addition to this work, miscellaneous upkeep and repairs and minor improvements at various hospitals are to be undertaken at an expense of approximately $106,000, all to be drawn from the naval hospital fund.

A. COMPLETED.

1. *Hospitals (main building only).*—a. Great Lakes, Ill.: A modified type hospital with integral parts abutting upon the administration building, instead of being connected with it by corridors, has been built in connection with the Great Lakes Training Station, and was occupied October 2, 1911. It consists of an administration building, operating and subsistence building, and two wings for wards, and has a normal capacity of 89 beds. It was constructed under the following contracts: (1) Building—with Noel Construction Co., dated June 11, 1909, for $231,400 (naval acts of May 13, 1908, and June 24, 1910). (2) Heating system and electric conduits—with D'Olier Construction Co., dated July 19 and September 21, 1909, for $43,242 (naval hospital fund). (3) Roads and roadways—with James Cape & Sons, dated August 7, 1910, for $20,787 (naval hospital fund).

b. Puget Sound, Wash.: This hospital, occupied January 3, 1912, although ultimately to conform to the plans of the type hospital, at present consists only of an administration building, operating and subsistence building, and one wing for wards, with a normal capacity of 63 beds. It was built under contract with the W. N. Concannon Co., dated March 29, 1909, for $149,820 (naval acts of Mar. 7, 1907, and May 13, 1908).

2. *Dispensaries and sick quarters.*[1]—Naval station, Tutuila, Samoa: The dispensary at this station was occupied in August, 1911, but the volume of work has so increased that an addition is necessary. The present structure consists of a main building (ward, dispensary, laboratory, surgeon's office, and Hospital Corps quarters), a subsistence building, an operating building, and toilet building, and has a normal capacity of 12 beds.

3. *Contagious disease buildings.*—Hospital, Brooklyn, N. Y.: Provision for contagious diseases was made by the conversion of a building formerly occupied as quarters by the medical officer in command of the medical supply depot. It consists of isolation space for four different contagious diseases and rooms for hospital corpsmen in attendance; also, through necessity, quarters for three members of the Nurse Corps. Its normal capacity is about 30 beds.

4. *Quarters (separate buildings).*—a. For medical officers, Great Lakes Hospital, Ill.: There were three buildings erected for this purpose, one for the commanding officer and two for junior officers. These quarters and the "laundry and disinfecting building," mentioned under "5. Other accessory buildings" of "Completed construction," were built by the contract dated June 11, 1909, at a contract cost of $79,000 (naval hospital fund).

b. For Nurse Corps, Brooklyn Hospital, N. Y.: These quarters are the result of remodeling and enlarging the building formerly used as a contagious disease building, and contain accommodations for 10 nurses.

5. *Other accessory buildings.*—a. Laundry and disinfecting building, Great Lakes Hospital, Ill. (See "4. Quarters.—a. For medical officers" above.)

b. A *mortuary* and a *building for the high-pressure steam disinfector* have been recently completed at the hospital, Brooklyn, N. Y.

[1] Appropriation under Bureau of Yards and Docks.

c. An ice house, two 3-room cottages, a stone hose-cart house, a stone house over the power-house well, and a new sputum and dressing incinerator have been erected at the hospital, Las Animas, Colo.

6. *Improvements.*—a. Additions: (1) Laboratory facilities.—A bacteriological room has been equipped at the dispensary, navy yard, Boston, Mass. A satisfactory animal house has been constructed at the dispensary, Olongapo, P. I., while that at the hospital, Guam, has been extended.

(2) Eye, ear, nose, and throat rooms.—Dark rooms for use in connection with work in these specialties have been provided at the dispensary, navy yard, Boston, Mass., and at the hospital, Guam.

b. General: Electric lights have been introduced into the hospital, Guam, and extensive repairs, the result of unusually heavy storms, have been completed at the dispensary, navy yard, Charleston, S. C., and at the hospital, Yokohama, Japan. A handsome bridge spanning the ravine between the hospital and training station at Great Lakes, Ill., has been completed.

B. UNDERTAKEN, BUT NOT COMPLETED.

1. *Hospitals (main building only).*—a. New England hospitals: These three type hospitals, located at Portsmouth, N. H., Chelsea, Mass., and Newport, R. I., each consisting of an administration building, solarium, operating and subsistence building, and two wings for wards, and having a normal capacity of 134 beds, are about 96 per cent completed. All three structures are being built by the Noel Construction Co., under one contract dated January 19, 1910, at a primary contract cost of $847,100 (naval hospital fund). The date of occupancy of these hospitals can not be definitely set, as it is impracticable to furnish and equip them and to erect adequate heating plants at Chelsea and Newport, owing to lack of funds. Temporary heating plants will be installed at these two hospitals for the purpose of preserving the buildings; that at Portsmouth will receive its power and heat from the naval station.

b. Pearl Harbor, Hawaii: This building is to be a type hospital, modified for the Tropics, and for the present will consist of an administration building, subsistence building, operating building, laboratory building, and one wing for wards, and will have a normal capacity of 89 beds. A most favorable site has been selected, the plans and specifications have been completed and approved, and the work will be done under contract, the funds being drawn from the $300,000 authorized by Congress (naval act of Mar. 4, 1911) for use in the construction of this main building and certain accessory buildings.

2. *Dispensaries and sick quarters.*[1]—a. Navy yard, New York: Remodeling of and additions to the old dispensary will be completed in the near future.

b. Naval station, Tutuila, Samoa: An additional building for dispensary purposes has been found necessary and a site has been selected, plans and specifications completed and approved, and material shipped from the United States. It will consist of a laboratory, examining and dressing rooms, and dentist's office.

3. *Contagious disease buildings.*—The urgent necessity for the immediate establishment of provisions for handling diseases of this class

[1]Appropriation under Bureau of Yards and Docks.

at the hospitals at Great Lakes, Ill., and Puget Sound, Wash., has determined the allotment of $10,000 from the naval hospital fund for this purpose. Ultimately they will each consist of an administration building and five wards, each ward to have a normal capacity of 20 beds, but only the administration building and three wards will be erected during the coming year. At both hospitals sites have been selected, and the plans and specifications (common to both) have been completed and approved. A permanent camp for contagious diseases is being built at Caracoles Point, Guantanamo Bay, Cuba, for the use of the Atlantic Fleet during its periods of concentration in that bay.

4. *Quarters (separate buildings).*—The only quarters that may be included under this section are those for the hospital at Pearl Harbor, Hawaii, consisting of 11 buildings—1 each for the commanding officer, pharmacist, members of the Hospital Corps and members of the Nurse Corps, 3 for junior medical officers, and 4 for civilian employees. The cost of all will be defrayed from the sum referred to under the naval hospital, Pearl Harbor, Hawaii. (B. 1. b.)

5. *Other accessory buildings.*—a. A *stable and garage*, a *mortuary*, and a *laundry building* are to be constructed at the hospital at Pearl Harbor, Hawaii, the cost to be defrayed from the $300,000 authorized by Congress for the hospital at that place. The *stable and garage* for the hospital at Great Lakes, Ill., has been decided upon and the work of construction has commenced.

b. The site for the *operating building* at the hospital, Guam, has been selected, the plans and specifications have been completed and approved, and material has been shipped from the United States. This building will consist of operating, sterilizing, etherizing, and dressing rooms on the upper floor and offices on the lower floor.

6. *Improvements.*—a. Additions: A third *diet kitchen* is being equipped at the hospital, Brooklyn, N. Y.

b. General: An incinerator and disinfector are being installed at the hospital, Mare Island, Cal.

C. CONTEMPLATED.

1. *Hospitals* (main buildings only).—a. Urgent: Puget Sound, Wash.: The addition of the east wing to the hospital at this station is a necessity.

b. Advisable: Olongapo, P. I.: The construction of a new hospital will be necessary in the next few years, as the present hospital (formerly the hospital ship *Relief*) is rapidly deteriorating. Should this station be developed in size and importance, the need for a large hospital would become imperative.

2. *Dispensaries and sick quarters.*[1]—There is pressing need for new dispensary buildings at Philadelphia, Pa., Fort Mifflin, Pa., Puget Sound, Wash., and Olongapo, P. I.

3. *Contagious-disease buildings.*—a. Urgent: Isolated structures for the care of contagious cases are needed at the hospitals at Portsmouth, N. H., and Pearl Harbor, Hawaii.

b. Advisable: The hospitals at Newport, R. I., and Norfolk, Va., should be provided with proper facilities for handling these cases.

4. *Quarters (separate buildings).*—a. For medical officers: There is urgent need for quarters at the hospitals at Portsmouth, N. H.,

[1] Appropriation under Bureau of Yards and Docks.

Newport, R. I., and Puget Sound, Wash., and a building for the commanding officer and two for junior officers should be erected at each place. In addition to these, one house for three junior officers should be built at the Norfolk Hospital.

b. For Hospital Corps: Quarters for the members of this corps on duty at Guam, are advisable.

c. For Nurse Corps: Owing to their isolated position, it appears advisable to erect quarters for the members of this corps on duty at the Las Animas and Puget Sound hospitals.

5. *Other accessory buildings.*—a. Stable and garage: Buildings for this purpose are urgently needed at the Norfolk and Puget Sound Hospitals, and their construction at the Portsmouth and Newport Hospitals appears advisable.

b. Heating plants: The installation of adequate heating plants at the hospitals at Chelsea and Newport is imperative before these buildings can be occupied, and it is planned to include the laundry in the same building in each case. The Mare Island Hospital is in immediate need of a heating plant, and it is contemplated to include in this structure an extension of the present kitchen and a room for convalescent patients.

6. *Improvements.*—a. Additions: An increase in the capacity of the *store room* at the medical supply depot, Mare Island, Cal., and a *remodeling of the dispensary building* at Charleston, S. C.,[1] are urgently needed.

b. General: The construction of proper *roadways* at the hospitals at Portsmouth, Chelsea, and Newport prior to their occupancy will be necessary, and an extension of those at the Washington Hospital is much needed. At the Puget Sound Hospital it is of the utmost importance that the grounds be graded and that drains, sewers, and water mains be properly laid.

Section III.—*Estimates.*

While no estimates have been directly submitted by this bureau for public works, recommendations have been made that the department authorize the Bureau of Yards and Docks to include in its estimates of appropriations for the fiscal year 1914 provisions for public works under this bureau's cognizance.

Under the appropriation "Medical Department" an estimate has been submitted for $510,000, an increase of $50,000 over 1912, with which fiscal year the estimate is in comparison by direction of section 6 of the sundry civil act approved August 24, 1912. Of this increase $30,000 is to meet additional expenses incident to the increase of 4,400 enlisted men of the Navy and Marine Corps authorized by the naval act for the fiscal year 1913, and $20,000 is for the purchase of original medical outfits for vessels which will be placed in first commission during the year.

Under the appropriation "Contingent, Medicine and Surgery," an estimate has been submitted for $142,000, an increase of $45,000 over 1913, of which $7,000 is to meet additional expenses of the increased personnel referred to in the preceding paragraph, $8,000 is for original dental outfits, and $30,000 for dental material other

[1] Appropriation under Bureau of Yards and Docks.

than outfits, required for the use of the Dental Corps authorized by the naval act approved August 22, 1912.

Under the appropriation "Bringing home remains of officers, etc., Navy Department," an increase of $2,000 is recommended. This appropriation is for the purely beneficent purpose of restoring to the bereaved families the bodies of their dead, and the increase is necessary in order that all cases may receive the same favorable treatment at the hands of Government.

The several estimates submitted as briefly outlined above are based upon the present authorized personnel of the Navy; should that be further increased by the act for the fiscal year 1914, corresponding increases would be necessary in each appropriation.

SECTION IV.—*Personnel.*

I. MEDICAL CORPS.

1. *General remarks.*—From July 1, 1911, to July 1, 1912, there were 7 medical officers admitted to the corps, while during that same period 10 were lost by reason of deaths, resignations, retirements, and being dropped; as a result, the actual strength of the corps on July 1, 1912, was 302 (including two extra numbers), and the number of vacancies was therefore 45.[1]

The Medical Corps has not expanded numerically in proportion to its enlarged responsibilities, for the authorized increase since 1882 of the naval personnel as a whole has been more than five times as great as in the Medical Corps, the percentages being, respectively, 514.5 and 102.3. Moreover, owing in part to conditions remediable by legislative action, there are now 45 vacancies in the regular corps, and the crippling effect of this shortage is constantly felt in endeavoring to meet the ordinary demands of the service. This has been more apparent during the fiscal year 1912 than heretofore, owing to the unusually high morbidity rate for that period (amounting to 362.45 per thousand, with a total of 2,694 sick days), 36 per cent of the corps having been retired by reason of ill health or on the sick list for varying lengths of time. It has been necessary during the year to leave most of the battleships and armored cruisers with but one medical officer, and acting assistant surgeons have been ordered to navy recruiting stations to replace those of the regular corps needed elsewhere. The requirement of one year's hospital experience has resulted in a higher grade of candidate, as shown by the fact that in the two years prior to the inauguration of this plan, 93 candidates took the examination and 38 failed professionally, a percentage of failure of 40.8; whereas, in the two years subsequent to the establishment of the rule, 57 candidates have taken the examination and 16 have failed, a percentage of failure of 28. The subjects of literature, history, and the natural sciences have been eliminated from the examination of assistant surgeons for promotion to the grade of passed assistant surgeon. In January, 1912, a medical officer was sent to Chicago, Ill., to act as president of a special examining board, and addresses have been delivered by the Surgeon General before the graduating classes of several large medical schools, hospitals, and societies upon the newer activities of the Medical Corps.

[1] On November 15, 1912, the number of vacancies was 53.

There is still a widespread impression throughout the medical profession that the Medical Corps of the Navy has not received the recognition in the way of rank and promotion which its activities deserve. It is believed that if the personnel bill which has been advocated by the department were enacted into law, with a clause providing for flag rank in the Medical Corps, that this attitude of the profession would be greatly modified and that there would thereafter be no difficulty in obtaining a sufficient number of qualified candidates to fill the corps.

2. *Activities.*—Unusual success has attended surgical procedures of magnitude at hospitals, reflecting great credit on individual operators and the general administration of the hospitals. The benefits derived from the increased activities and the broader scope of work of the Medical Corps have become evident, particularly in promoting military efficiency.

Research work bearing upon special conditions and diseases in Guam and Cavite, P. I., has been carried on with gratifying results. A representative of the corps has recently returned from the Southern States where he has been engaged in the study of pellagra, under the Robert M. Thompson fund, placed with the New York Postgraduate Medical School and Hospital. From time to time, upon invitation, medical officers have represented the Navy Department at various society meetings, conferences, and conventions, both in the United States and abroad. Many such invitations were of necessity not accepted, owing principally to shortage in the corps. International aid in time of war (or disaster) was rendered in China during the recent revolution.

Several officers, at their own expense, have devoted their leave to special studies (eye, ear, nose and throat, surgery, and chemistry) both at home and abroad, with marked benefit to the service, and so far as practicable such officers have been assigned to duty giving them opportunities to practice their specialty. The work of members of the corps, as health officers of island ports and municipalities, has been active and resulted in great good.

II. MEDICAL RESERVE CORPS.

The legislation passed by the last Congress, whereby a Naval Medical Reserve Corps was established, will have a far-reaching influence upon the efficiency of the Navy. The benefit resulting from both military and humanitarian standpoints will be inestimable, as trained men of high standing will be available to bring the number of medical officers up to a proper percentage of the entire naval personnel.

In time of peace members of this corps will be placed upon active duty in sufficient numbers to allow of a full quota of medical officers of the regular service at hospitals and stations and on board ship, a condition which has not been possible for some time in the past. In time of war one of the greatest advantages resulting will be the practicability of establishing a perfectly organized, rapid, and humane method of evacuation of and caring for the wounded from fleets after an engagement.

III. DENTAL CORPS.

The advantages which will accrue from the establishment of a corps of trained dentists are well recognized, and the recently passed law establishing such a corps upon a firm foundation is most gratifying. It will now be possible to provide the personnel of the Navy with this type of professional service at the hands of graduate dentists of approved worth and in sufficient numbers.

The members of the Hospital Corps, who have been faithfully and satisfactorily performing this duty and who fulfill the requirements specified in the law, will be given an opportunity to take the examination for the new corps, and if successful will receive commissions, while those failing to qualify for the higher position will be allowed to continue their special work as assistants to the commissioned dental surgeon.

The wording of the present law which permits the appointment of dentists to the Medical Reserve Corps for the practice of their specialty is regrettable and places those dentists who enter it in an anomalous position. The bureau feels that the establishment of a separate dental reserve corps would be to the interest of the service for reasons similar to those advanced in behalf of the Medical Reserve Corps, but the law as enacted might give rise to unforeseen and untoward complications and its modification is eminently desirable.

IV. HOSPITAL CORPS.

1. *Pharmacists.*—The enactment of legislation establishing the grade of chief pharmacist is most opportune and will redound to the benefit of the service by increasing the prestige of this corps and stimulating enlistments in the lower grades. The assignment of pharmacists to duty in connection with the commissary departments of hospitals is now a thoroughly established policy and proves more and more satisfactory. One pharmacist retired during the past year and examinations have been held to fill this vacancy and those created by the establishment of the grade of chief pharmacist from the hospital stewards who were eligible.

2. *Enlisted men.*—The established allowance of hospital corpsmen (3 per cent of the Navy personnel) is ample, but it has been impossible to recruit this number, there being at present 400 vacancies. The number of reenlistments, based upon an average strength of 1,200 men, was only 12 per cent during the past year. This is due, as has been fully explained before, to the fact that there is no graded promotion in this corps as there is in every other branch of the enlisted personnel. By suspending enlistments from civil life in the rating of hospital steward, and filling vacancies from the rating of hospital apprentice, first class, and by filling all vacancies occurring in the grade of pharmacist from the rating of hospital steward, the bureau has been able to increase the attractiveness as well as the efficiency of the corps to a slight extent, and the establishment of the grade of chief pharmacist will produce a beneficial result. If the system of progressive ratings corresponding to those of other branches of the service were inaugurated in the Hospital Corps, a great injustice would be corrected and there would be no difficulty in recruiting it to its full allowance, and the bureau urges that this be done.

The number of hospital corpsmen engaged upon dental duty has been steadily increasing, thus replacing the civilian dentists at various stations and providing others which heretofore have been without this necessary professional attention. The hospital stewards in charge of the medical department on the various torpedo-boat destroyers have discharged their responsible duties admirably.

V. NURSE CORPS.

The work of this corps has been unqualifiedly excellent, and their influence for betterment of conditions surrounding the sick in naval hospitals has been realized and appreciated throughout the service. A definite, systematic method of work and instruction has been established at all hospitals, thus enabling nurses to readily adapt themselves to the new duties when transferred from one hospital to another. Special work has been done in operating rooms, laboratories, and diet kitchens, and a number of the corps are particularly skilled in massage, while still others are well qualified in the management of the X-ray apparatus, both for photographic and therapeutic purposes. During the year July, 1911, to July, 1912, 55 new members were appointed, the corps numbering 110 on July 1, 1912, 25 of the original 32 having entered upon their second term of three years. Two additional hospitals, namely, those at Guam, and Chelsea, Mass., have been provided with members of this corps, and the number at several other hospitals has been increased. The appointment of chief nurse should be regarded as a permanent one, unless revoked for good cause, and those holding such appointment should not be reduced to the grade of nurse while on leave with pay or when traveling under orders, and, further, sick leave, when indicated, should be granted by the Surgeon General.

SECTION V.—*Recommendations.*

A. RELATIVE TO HYGIENE AND SANITATION AND THE CARE OF THE SICK.

1. The detail of a properly qualified medical officer as inspector general of the Medical Department, to serve under the aid for inspections.

2. Erection of sanitary barracks, provided with means for recreation, at navy yards, for the accommodation of the crews of ships undergoing extensive repairs.

3. Substitution of a sanitary unit system of barracks for receiving ships.

4. The appointment of a board for the study of the subject of clothing and uniforms, and that a representative of the Medical Corps be assigned to this duty for the purpose of discussing the hygienic features of the question.

5. The appointment of a board for the study of the subject of illumination on board ship and elsewhere, and that a representative of the Medical Corps be assigned to this duty for the purpose of discussing the hygienic features of the question.

6. The appointment of a board for the study of crews' heads, and that a representative of the Medical Corps be assigned to this duty for the purpose of discussing the sanitary features of the subject.

7. Abolition of prison ships.
8. That the tours of duty of ships in Central American waters be shortened.
9. That the station ship at Tutuila, Samoa, make periodic trips to Australia or New Zealand.
10. That no city harbor water be used for cleaning purposes.
11. That all staterooms on board ship be thoroughly cleaned and disinfected before the successor takes possession.
12. Prohibit purchasing or contracting for undressed cold-storage poultry.
13. Issue overcoats to prisoners released during the winter season in cold climates.
14. Require *all* persons on board ship to participate in the physical drills once daily.
15. Officers to take exercise in the open air amounting to 5 hours a week and to select their own mode of taking such exercise, certifying to its completion at regular intervals.
16. Raise the physical standard for firemen and coal passers and make no transfers to these ratings from other ratings unless this standard is complied with.
17. Provide a cruising parent ship for the Pacific Torpedo Fleet.
18. Restriction of professional services rendered to families of officers and men by members of the Medical Corps.
19. Forfeiture of pay of all persons in the service during disability from disease of venereal origin, such forfeiture to be credited to the Naval Hospital Fund.
20. That those exposed to the damaging effects of gun blasts and ear injuries incident to aviation be required to wear ear protectors.
21. That the present system of drills be modified to provide longer relaxation periods.

B. RELATIVE TO BATTLE CONDITIONS AND HANDLING OF THE WOUNDED.

1. Construction, on accepted plans, of a hospital ship for each fleet.
2. Compulsory use of identification tags during battle practice and in action.
3. Provide permanent stretcher bearers on board ship equivalent in number to 2 per cent of the personnel.
4. Provide vessels, properly equipped as transports, for the conveyance of expeditionary forces.

C. GENERAL.

1. Amalgamation of the Medical Corps of the Navy with the Line of the Navy.
2. Assignment of medical officers of the fleet to brief periods of duty on the hospital ship.
3. That steps be taken toward the ultimate abandonment of Las Animas as a naval hospital.
4. Provision of Government quarters for all officers at Guam, Mariana Islands.

C. F. STOKES.

REPORT OF THE MAJOR GENERAL COMMANDANT OF THE UNITED STATES MARINE CORPS.

HEADQUARTERS UNITED STATES MARINE CORPS,
Washington, October 17, 1912.

In compliance with the department's instructions, I have the honor to submit the following report of the condition and service of the United States Marine Corps for the last fiscal year.

During the period covered by this report, inspections of the marine barracks at the navy yards and stations, both in the United States and in the insular possessions thereof, have been made, as far as practicable, either by the undersigned or by officers of the adjutant and inspector's department. Favorable reports as to the personnel, so far as pertains to health and discipline, have generally been made of those posts which have been visited by the inspecting officers. As stated in former reports, adverse criticism has been made of some of the barracks, due to their being obsolete both as to construction and capacity, and to lack of proper accessories; but there is no way of obviating this unless the Congress appropriates for new and necessary barracks and other buildings.

PERSONNEL.

While it is not considered that the full effect will be felt inside of three years, the adoption of a system of recruiting whereby applicants are not enlisted without a thorough reexamination at recruit depots, the establishment of recruit depots, and the organization of companies at the larger yards, have resulted in a decided improvement in the enlisted personnel of the Marine Corps; this is shown by the large reduction during the past year in desertions and in discharges by medical survey.

The present system, whereby the whole Marine Corps on home service is scattered in numerous navy yards, is neither economical nor conducive to proper training, and it is urgently recommended that the department adopt the policy of having at least one large post on each coast, eventually to be capable of housing a brigade of two regiments at war strength, with its necessary field equipment.

In this connection it is desired to invite the department's attention to the fact that the duties the Marine Corps is called upon to perform are such that it is a necessity, if the best results are to be obtained, that it be at all times upon what is practically a war footing, and that rapidity of mobilization and efficiency in training can be best obtained by the large posts suggested.

The proportion of officers to men in the Marine Corps is entirely too low, and on the expeditions during the past year, though every officer available was taken, the organizations were underofficered. The present proportion is 1 officer (line and staff combined) to 34½ enlisted men; this is about the proper proportion for company officers of the line, but when the necessary number of staff officers and field officers of the line, officers on detached duty, sick, en route to and from foreign service, etc., are considered, the proportion is too small by at least one-third, and it is believed that the proper proportion is 45 officers to 1,000 men—that is, approximately 1 officer to 22.2 men. A properly organized regiment has 1 officer to 25 men, and as regiments are organized, with the present proportion, the situation grows

worse and worse. In the second regiment sent to Cuba this year, and in the regiment sent for service in Santo Domingo, it became necessary to make the companies of approximately 127 men each and to strip many of the posts of all except 1 line officer. It is also brought to the attention of the department that the organization of expeditionary brigades has become quite frequent, and that the rank proper to the command of brigades is brigadier general, of which rank there are at present no officers in the Marine Corps.

In order that the corps may be able to meet the demands made upon it without depleting the garrisons at yards and prisons in the United States, that the work of the Advanced Base School may not be interrupted, that its system of recruit training may be carried out, and that the lack of officers may be relieved, it is recommended that the necessary representation be made to the Congress for an increase during the coming year of 49 officers and 800 enlisted men. This increase in officers, if allowed, would give 1 officer to 27.2 men, or 36¾ officers per 1,000 men, which is considerably below the number required.

Examinations are being held to fill the vacancies created in the commissioned personnel by the naval appropriation act which was approved August 22, 1912, and as soon as commissioned these officers will be assigned to the Marine Officers' School for instruction.

It is expected that the 400 additional men provided by the above act will be enlisted and the corps recruited to its authorized strength by February 1, 1913. All of this increase has been absorbed by the adoption of the policy of placing marine detachments on the smaller ships, by the commissioning of the *Wyoming*, and the establishment of disciplinary barracks at the navy yard, Puget Sound, Wash.

ENLISTED FORCE.

Gains and losses in the enlisted force during the year have been as follows:

Enlisted	4,310
Deserters rejoined	22
Prisoners restored	11
Total gain	4,343
Discharged	2,940
Died	29
Deserted	917
Retired	12
Prisoners sentenced to dishonorable discharge	173
Total loss	4,071
Net gain	272

DISTRIBUTION OF FORCE.

Summary of distribution of officers and enlisted men June 30, 1912:

	Officers.	Enlisted men.
On shore duty:		
Inside United States	116	3,470
Outside United States	77	1,974
On expeditionary service	69	2,008
On board ship:		
On receiving ships	3	407
Cruising vessels	54	1,708

In addition to the above, there were 172 general court-martial prisoners sentenced to dishonorable discharge.

RETIREMENTS, RESIGNATIONS, DEATHS, ETC.

During the past year there were three retirements, three resignations, and two dismissals among the officers of the Marine Corps on the active list, and one death on the retired list.

GOOD-CONDUCT MEDALS.

During the past year 940 good-conduct medals and 183 good-conduct medal bars have been issued to men of the Marine Corps.

DEPOSITS.

The benefits of the present system of savings deposits have continued to be availed of throughout the last fiscal year, and the amount of deposits now to the credit of men of the corps shows that the spirit of thrift among the men is constantly increasing. Special instruction in regard to this privilege is given at recruit depots.

RECRUITING.

There are now 10 recruiting districts and 140 stations. The following statement shows the progress of recruiting during the fiscal year ended June 30, 1912:

	Fiscal year ending June 30—	
	1911.	1912.
Total number enlisted	4,161	4,310
Increase in enlistments, 4 per cent.		
Net desertions	1,298	917
Percentage of desertions to total borne on rolls	9.7	6.7
A decrease of desertions of 31 per cent.		
Apprehended and surrendered from desertion	140	218
An increase of apprehensions, etc., of 56 per cent.		
Dishonorable discharge, sentence general court martial	219	173
A decrease of dishonorable discharges of 21 per cent.		
Reenlisted from Marine Corps	536	729
Percentage reenlisting from Marine Corps	12.9	20.0
Total reenlistments (including those from Army)	834	998
Percentage of reenlistments	16.9	23.1
Discharges by medical survey within three months of date of enlistment	226	47
A decrease of medical surveys of 79 per cent.		
Cost per recruit, including transportation	$57.99	$61.14
Cost per recruit, excluding transportation	$38.88	$40.75

This increase in the cost per recruit is more apparent than real and is caused by the fact that under the system in vogue during previous years the number used as a divisor into the total amount spent included all of those men who deserted and were surveyed within three months after enlistment, whereas under the present system these men are classed as "elopers" or "rejected" at recruit depots and do not appear under the caption "Total enlisted." In other words, the cost per recruit in the fiscal year 1912 is a close approximation of cost

per net recruit, whereas in former years the cost shown was cost per gross recruit.

This apparent increase in cost per recruit is more than offset by the large saving in pay and allowances to a smaller number of deserters, and pay, allowances, and mileage to 79 per cent less men discharged by medical survey.

The standard of recruits, both as to physique and educational requirements, has been materially bettered during the year.

At the present time the Marine Corps is short of its authorized complement by 438 men, due to the fact that on the 22d of August, 1912, the authorized enlisted strength of the Marine Corps was increased by 400 men, at which date the corps was practically at its full complement as then authorized.

The new system of recruiting and training, as outlined in last year's report, has been an unqualified success, as disclosed by the above table. Since January 1, 1912, when the new system became well established, the number of desertions to the close of the fiscal year was 420 as compared with 634 for the same period of the preceding fiscal year, a decrease of 33⅓ per cent.

By means of the finger-print system applicants endeavoring to enlist fraudulently have been, since October 1, 1911, prevented, as follows:

Formerly in Marine Corps	105
Formerly in Navy	40
Formerly in Army	25
Fraudulent applicants detected	170

Since the same date the finger-print files have been the means of detecting 82 former marines who sought to enter the Navy and 20 former marines who sought to enter the Army, claiming no prior service.

A comprehensive set of instructions governing the recruiting service has been issued, printed in neat pamphlet form.

RECRUIT DEPOTS.

In July, 1911, recruit depots were established at Philadelphia, Pa., at Mare Island, Cal., and at Puget Sound, Wash.

On August 30 the buildings occupied by the Marine Officers' School and the recruit depot at Port Royal, S. C., were turned over to the Navy for disciplinary purposes. This necessitated moving the Marine Officers' School to Norfolk, Va., and establishing recruit depots at Charleston, S. C., and Norfolk, Va.

Experience having demonstrated that the best results could not be obtained with small depots, the ones at Charleston, S. C., and at Puget Sound, Wash., were closed about June 1, 1912, all recruits on the west coast being sent to the depot at Mare Island, Cal. This consolidation has resulted in a decided improvement on the west coast; and, while the results have not been so marked on the east coast, due to lack of proper equipment at Norfolk, Va., for the number that have been accommodated, there has been a considerable reduction in expenses of transportation.

The establishment of a single large depot with proper equipment and buildings for the Eastern States would result in a decided im-

provement, and, once established, could be maintained at reduced per capita expense.

Neither Philadelphia, Pa., Norfolk, Va., nor Mare Island, Cal., is properly prepared to handle recruits, and the desired results can not be obtained until the Marine Corps is provided with the necessary buildings for a fully equipped recruit depot on each coast.

On the west coast Mare Island is decidedly the best location, and of all the posts on the eastern coast Norfolk, Va., furnishes the most advantages for a recruit depot. Adjacent to the Marine Corps reservation at that yard is a considerable extent of unoccupied ground belonging to the Navy, which, if utilized for the above purposes, would enable a depot to be built capable of handling all the recruits on the Atlantic coast.

It is therefore recommended that this land be assigned to the Marine Corps for this purpose and that this office be authorized to prepare the estimates for the construction of the necessary buildings for a complete depot at that post.

During the fiscal year recruits have been under instruction, as follows:

Philadelphia, Pa	906
Norfolk, Va	1,075
Charleston, S. C	486
Mare Island, Cal	502
Puget Sound, Wash	255

Owing to the urgent necessity for men for expeditionary service it has been necessary at times to send men to active service when the course at the recruit depot was only half completed. This is unfortunate, as it is believed that the desired results can not be obtained in less time than is allotted to the full course of instruction. In order, however, to meet this condition as far as possible the course as originally laid out has been changed so that by the end of the ninth week recruits are fairly well equipped for field service. When the weather will permit, the seventh, eighth, and ninth weeks are devoted to instruction in rifle firing and range practice, the whole course having been lengthened to 14 weeks.

The results obtained at the Marine Corps rifle range, Winthrop, Md., have been most satisfactory, approximately 720 having already fired the Army marksman's course with about 46 per cent of qualifications.

PHYSICAL TRAINING.

The Swedish system of physical training, as adapted by Surg. Joseph A. Murphy, United States Navy, has been in use at the recruit depot with satisfactory results. It is recommended that the system be extended to the whole service, replacing the present official system of physical exercises.

The duties the Marine Corps is called upon to perform are so arduous that it is necessary that the officers and enlisted men be in the best of physical condition, and to this end it is recomended that the policy be adopted of erecting suitable gymnasiums at the various posts not so equipped; the lack of buildings of this character is especially felt at the recruit depots.

TRAINING FOR SEA SERVICE.

The marine barracks, Naval Academy, Annapolis, Md., has been used for training men for service afloat and for assembling detachments for ships about to be put in commission, but on account of the necessity of transferring all available men to expeditionary service, it is impossible to determine the benefits derived from this system.

COMPANY ORGANIZATION.

Company organization at the larger posts has worked well, though the training deemed necessary by this office has not been possible, due to the requirements of guard duty. This office considers that the present system of guarding navy yards requires an excessive number of men, and that by the extension of the patrol system the yards can be properly guarded with a smaller number of men and more time made available for the training of officers and men in their naval and military duties.

All the organized companies on the Atlantic coast have been on expeditionary service, and the company organization, together with the adoption of a system of keeping pay-roll data in service record books, has resulted in more efficient mobilization than was possible under the old method.

SHIP'S DETACHMENTS.

During the past year the policy of placing marines on small ships has been adopted, and the size of marine detachments allotted to ships of the Navy has been standardized, the numbers being based on the types of ships and the size of the crews.

This office regrets that owing to the shortage of officers and men in some cases smaller detachments had to be provided than the department originally contemplated. It believes that the best results will obtain when there are sufficient officers and men available to assign an officer to each small detachment and to have no detachment of less than one section of 27 men.

In this connection it is recommended that officers, while serving at sea, receive the increase of 10 per cent now authorized by law for officers of the Navy, and that, if practicable, this provision be extended to include men of the Marine Corps.

TARGET PRACTICE.

Target practice has been conducted in the Marine Corps with excellent results this season. The range of the Bay State Rifle Association at Wakefield, Mass, was leased by the Marine Corps for the season, and, through the courtesy of the War Department, the Army range at Fort Barry, Cal., has been used by the marines at Mare Island, Cal., and detachments from ships in that vicinity.

The Marine Corps rifle range at Winthrop, Md., has afforded practice to the recruits from the depots at Norfolk and Philadelphia, and the most gratifying results have been obtained with these men. Rifle practice is considered an indispensable part of the recruit's training, and the Winthrop range has been an invaluable adjunct to the large recruit depots at Norfolk and Philadelphia.

The qualifications for the target year 1912 to date are as follows:

	Officers.	Enlisted men.
Expert riflemen	15	148
Sharpshooters	14	1,059
Marksmen	1	383

By an appropriation of $7,000 the Marine Corps was enabled to extend and improve the range at Puget Sound, Wash., which now affords facilities for target practice to the command at Puget Sound and to the detachments of such ships as may be in that vicinity.

COMPETITIONS.

The competitions prescribed in General Order No. 112, Navy Department, April 26, 1911, are held whenever practicable and undoubtedly stimulate interest in target practice.

On April 6 to 8, 1912, the rifle match for the open championship of North China was held at Tien-Tsin, China. There were 215 entries from foreign troops and rifle clubs of Peking, Tien-Tsin, and vicinity. This match was won by Pvt. Chester Hendrickson, of the Marine Corps, and members of the Marine Corps took the third, fourth, fifth, sixth, and seventh places, respectively.

The International Legation Guards rifle match took place at Peking, China, on June 5, 1912, teams from the American, British, German, Holland, Russian, and Italian legations competing. The marine detachment of the American legation took first place in the team match. In the individual match the five American marines entered took the first five places. Pvt. Ray J. Cook took first place in the individual match.

MARINE CORPS RIFLE TEAM.

A rifle team squad was organized at Wakefield, Mass., on August 9, 1912, under command of Capt. Harry R. Lay. The team competed in 11 matches at Wakefield, Mass., winning 8 first places. In the latter part of August this squad proceeded to Sea Girt, N. J., for the matches of the New Jersey State Rifle Association, winning the Evans skirmish match and a number of individual matches. Considering the fact that practically all of the men were new, had had no previous experience with a rifle team, and were assembled but a short time previous to the matches, their work was excellent. No national match was held this year.

COOKS AND BAKERS.

The War Department having granted authority for the instruction of men of the Marine Corps at the Army training schools for cooks and bakers, located at Washington Barracks, D. C., and the Presidio of San Francisco, Cal., orders were issued for the detail of two men to take the course of instruction at Washington Barracks for the term beginning September 15, 1911, also the detail of two

men to take the course at Presidio of San Francisco. The men on the east coast are detailed monthly, and those on the west coast, beginning October 15, 1911, bimonthly. The men selected for instruction have been taken from the various posts on the Atlantic and Pacific coasts, and the results obtained are constantly being shown by the improvement of the messes in connection with the establishing of the component-ration system which was referred to in my last Annual Report.

EXPEDITIONARY FORCES.

A provisional brigade of marines, consisting of 69 officers and 2,008 men, was assembled at Philadelphia, Pa., and Norfolk, Va., for temporary foreign tropical shore service. The First Regiment, consisting of 29 officers and 756 men, under command of Col. Lincoln Karmany, embarked on the U. S. S. *Prairie*, at Philadelphia, Pa., May 23, 1912. The Second Regiment, consisting of 40 officers and 1,252 men, under command of Col. James E. Mahoney, was distributed on the following vessels of the United States Atlantic Fleet, which sailed on May 25, 26, and 27, 1912: U. S. S. *Georgia*, *Minnesota*, *Mississippi*, *Missouri*, *Nebraska*, *New Jersey*, *Ohio*, *Rhode Island*, and *Washington*. Col. George Barnett assumed command of the First Regiment on June 7, 1912, relieving Col. Lincoln Karmany, who assumed command of the First Provisional Brigade, consisting of the First and Second Regiments. With the exception of a battalion of two companies retained at Camp Meyer, Cuba, the officers and men who composed this brigade returned to the United States on July 9 and 24 ,and on August 5, 1912, and were sent back to the posts from which they were originally drawn.

Early in August a battalion of marines, consisting of 10 officers and 338 men, was transferred from Panama to Nicaragua for duty. A provisional regiment of marines, consisting of 29 officers and 750 men, under command of Col. Joseph H. Pendleton, was assembled, embarked, and sailed from Philadelphia on the U. S. S. *Prairie* on August 24, 1912, for service in Nicaragua. On September 27, 1912, a regiment of 28 officers and 767 men, under command of Col. Franklin J. Moses, was assembled, embarked, and sailed from Philadelphia on the U. S. S. *Prairie* for duty in Santo Domingo.

CAMPAIGN BADGES.

Since the date of last Annual Report the following campaign badges and bars have been issued to officers and men of the Marine Corps:

Civil War campaign badges and bars	26
Spanish campaign badges and bars	12
China campaign badges and bars	14
Philippine campaign badges and bars	21
Army of Cuban Pacification badges and bars	155

ADVANCED-BASE SCHOOL.

In July, 1912, this office issued instructions covering the work to be carried on at this school, the objects being:

(*a*) To train the officers and men in the handling, installing, and using to the best advantage in action of such advanced-base matériel as may be provided.

(*b*) To investigate and determine what matériel is needed for, and is best suited to, advanced-base work. This includes number, caliber, and types of guns; quantities and kinds of ammunition; number and types of mines; types of gun platforms; types of magazines; automobile and torpedo defense; water and land transportation; and in general the number and types of all the various appliances required to transport, install, and fight the matériel provided for the defense of advanced bases.

(*c*) Theoretical study by officers of such military and naval subjects as pertain to the selection, occupation, and attack and defense of advanced-base positions, or to expeditionary service in general, including the services of communication, supply, and sanitation. The course of one year was divided into two parts:

(1) November 1 to April 30, inclusive: To be devoted to theoretical work, with such practical exercises as the weather would permit and as could be carried on indoors.

(2) May 1 to October 31: To be devoted to practical work, with such theoretical work as might be considered desirable. During this period the advanced-base battalion should be trained in field maneuvers, camping, handling of heavy weights, mounting and dismounting of guns, and, if practicable, embarkation and debarkation, under conditions as nearly similar as practicable to those which would probably exist in actual service.

A careful study has been made of all the ordnance and other matériel required for an advanced-base outfit, and a special report has been made to the department on this subject, together with a report on the amount of stowage space that would be required on board a transport.

While the types of guns required have been determined, no satisfactory platform has as yet been devised, though experiments are now being carried on to this end. Platforms constructed in accordance with plans submitted were tried out at the Naval Proving Grounds, Indian Head, Md., but were not satisfactory.

Considerable work has been done looking to the improvement of the naval-defense mine, and experiments will be carried on as soon as practicable to determine the utility of the recommendations made.

All the advanced-base matériel on the Atlantic coast has been assembled at Philadelphia, Pa., but little of it would be of use in case of hostilities.

It is recommended that, as soon as practicable, the various pieces of ordnance required for an advanced base be assembled. The Bureau of Ordnance has allotted $50,000 to be expended during the current fiscal year for the purchase of accessories. Before all this matériel is assembled it will be necessary to have a special storehouse built for the outfit, as rapid embarkation will require that the matériel be placed in the storehouse in accordance with a well-thought-out plan of stowage. This storehouse should be of sufficient size to permit indoor handling of heavy weights during the winter months.

A class of officers was assembled prior to the 1st of November, 1911, and the prescribed theoretical course was carried out. In May, owing to the urgent necessity for an expeditionary force, the officers and men attached to the Advanced Base Battalion were transferred to foreign service, and are still absent from the United States.

The proper training of officers and men in advanced-base work can only be accomplished through consistent, progressive work, carried on without interruption, and it is believed that the desired results can not be obtained until the Marine Corps has a sufficient number of officers and men to enable it to provide the ordinary expeditionary force without calling upon the force engaged in the advanced-base training. So far it has not been possible to bring the Advanced Base Battalion to a greater strength than approximately 300 men.

To install an advanced base outfit and properly defend it will require a brigade of two regiments of approximately 1,300 officers and men each; one regiment being for fixed defenses and the other for mobile defenses, each to act as a reserve for the other. The force assigned to the fixed defenses should be the one stationed at the advanced base school, and this office desires to represent to the department its belief that a sufficient number of officers and men should be provided to enable the fixed defense regiment to be brought to its full strength at the earliest practicable date.

AVIATION.

In view of the great benefit to an advanced base force that might result from trained aviators, two officers and one man of the Marine Corps have been under instruction in aviation at the United States Naval Academy, Annapolis, Md., and it is hoped that during the coming year this number may be considerably increased.

TRANSPORTS.

The attention of the department is invited to the urgent necessity for properly designed and fitted-out transports for use of the Marine Corps. At present the only ship available on the Atlantic coast is the U. S. S. *Prairie*, and while 750 to 800 officers and men can be transported on this ship for short trips, yet this can be done only by most insanitary crowding, the extent of which can be realized only by those who have served on board under those conditions. Transports for use of the Marine Corps are required for:

(*a*) Expeditions.
(*b*) In connection with peace training, in advanced base work.
(*c*) Relief of men on foreign service.

MARINE OFFICERS' SCHOOL.

The operations of the Marine Officers' School, which on August 30, 1911, was moved from Port Royal, S. C., to Norfolk, Va., were carried on until the end of May, 1912, when, owing to expeditionary service, the class at the school was graduated and transferred to active service.

During the past year the officers under instruction were required to live in tents and were subject to a great deal of discomfort, and carried on their work under very trying circumstances, particularly during the severe weather of the winter months. In view of the most beneficial results derived from requiring all officers appointed to the Marine Corps to take the course of instruction laid down, it is earnestly recommended to the department that the necessary steps

be taken to provide at the navy yard, Norfolk, Va., in connection with the Marine Barracks, a suitable building, capable of accommodating, at its full capacity, a class of 30 officers, together with the necessary class and lecture rooms. In this connection it is desired to renew the recommendation that hereafter, so far as practicable, officers of the Marine Corps be appointed from graduates of the United States Naval Academy, and that the necessary steps be taken to amend the present law so that graduates may be appointed to the Marine Corps upon graduation.

It is further recommended that in case of civilian appointments the age limit be changed so that appointments will be limited to those not less than 19 years nor more than 23 years of age; that all appointments be on probation for a period of two years; and that no ex-midshipman who has been dropped or dismissed from the Naval Academy shall be commissioned in the Marine Corps prior to the graduation of the class to which he belonged.

INSTRUCTION OF OFFICERS AT ARMY SCHOOLS.

Two field officers of the Marine Corps completed the course of instruction at the Army War College for the school year ended June 30, 1912. Two field officers took the course of instruction for field officers at Fort Leavenworth, Kans., during the months of January, February, and March, 1912. These two officers have been detailed to take the course of instruction at the Army War College, Washington, D. C., for the school year beginning September 1, 1912.

Two captains of the Marine Corps graduated from the Army School of the Line, Fort Leavenworth, Kans., on June 21, 1912, and two other captains have been detailed to take the course during the coming year.

LANGUAGE STUDIES OF MILITARY ATTACHÉS.

Four officers of the Marine Corps are detailed as naval attachés and are under instruction as students of foreign languages, as follows: Two at the American Embassy, Tokio, Japan, and two at the American Legation, Peking, China. From reports received at this office it is understood that they are making very satisfactory progress.

MATÉRIEL.

During the past year the money appropriated by Congress for the maintenance of the Marine Corps has been judiciously expended. The appropriation "Repair of barracks" has been utilized in making such minor repairs and alterations as were necessary to keep the barracks in proper condition for habitation. As has been the case in past years, a great drain has been made on this appropriation because of the condition and requirements of the older barracks.

The report of the officer in charge of the quartermaster's department shows that minor repairs and improvements have been made during the past year at all the stations.

The policy adopted by the department of having the Bureau of Ordnance, United States Navy, furnish to the Marine Corps all ordnance material other than small-arm ammunition and equipment will result in a decided improvement in the preparedness of the Marine Corps for active service and for service on board ship.

CHARLESTON, S. C.

Barracks and quarters have been provided with screens, and new plumbing, lighting, and heating fixtures have been installed. The old barracks building was overhauled and placed in use as a dormitory for recruits. This post was visited by a hurricane in August, 1911, but the damage was slight, amounting to about $350.

DEPOT OF SUPPLIES, PHILADELPHIA, PA.

The present building occupied by the depot of supplies in Philadelphia, Pa., is inadequate to the demands being made upon it and it has become necessary to rent suitable space in a building located about one-quarter of a mile from the depot, for which an annual rental of $2,550 is paid. It is from this depot that all expeditionary forces on the Atlantic coast are fitted out, and as funds become available it is considered necessary to increase the supplies carried at this depot to the amount required to fully equip 3,000 men.

An item of $175,000 was included in the public works estimates of the quartermaster's department for 1914 for the purpose of purchasing a site and erecting an addition to the present building for the use of the depot, and it will be in the interests of economy as well as efficiency to secure this appropriation for the object stated.

DEPOT OF SUPPLIES, SAN FRANCISCO, CAL.

The importance and work of the depot of supplies in San Francisco is steadily increasing. The report of the depot quartermaster in charge at that point shows that during the past year the increase in the value of stock received was $103,180.49. The disbursements exceeded the disbursements of the previous year by $17,681.23.

The building formerly occupied by this depot was neither fireproof nor adequate in size, and about September 1, 1912, the depot was moved to 36 Annie Street, San Francisco, and now occupies a new modern, fireproof structure of adequate size.

There are, at present, in this depot, stores for an expeditionary force of approximately 500 men. These will be increased immediately to the amount necessary for 750 men, and, as funds become available, to that necessary for a complete regiment.

KEY WEST, FLA.

These headquarters have recommended that the unexpended balance of the special appropriations asked for the erection of officers' quarters at Pensacola, Fla., under acts approved March 22, 1907, and May 13, 1908, be transferred for use in the erection of suitable quarters at Key West. Congress granted this request in the naval appropriation act approved August 22, 1912, and plans are now being prepared for one house in accordance therewith.

MARE ISLAND, CAL.

This has always been the principal station of the Marine Corps on the Pacific coast, and it is expected that its importance will increase in the future, as it is understood to be the policy of the department that an advance-base force will eventually be assembled there.

The present buildings are old, insanitary, and with the exception of the barracks and officers' quarters, are of a temporary nature, and are entirely inadequate for the command that is now necessary to be quartered at this post. At present approximately 500 men are living in tents. This method of housing men is most expensive, owing to the fact that tentage rapidly deteriorates. With a view of reducing expense under this head, until Congress provides permanent facilities, 13 small, temporary, frame buildings, for the accommodation of 100 men, were erected as an experiment. While this is an improvement over the tentage, it is a most unsatisfactory method of providing shelter.

The grounds, walks, etc., at this post have been extended and otherwise improved, and construction has been authorized of a central heating plant.

The recruit depot on the Pacific coast has been established at this station, and in view of the lack of facilities and proper buildings at this post, it is strongly recommended that representation be made to Congress as to the urgent necessity of providing suitable buildings for a complete post at that place.

MARINE CORPS RIFLE RANGE, WINTHROP, MD.

More or less extensive improvements have been made at this station from time to time during the year out of the appropriation made by Congress of $20,000 in the act approved March 4, 1911. These were made under the direction of the Bureau of Yards and Docks under the head of "Public works." The Quartermaster's Department has erected a new bakery and installed proper fire-fighting facilities, the chemical fire engine formerly used at Newport, R. I., having been transferred to Winthrop when the former post was abandoned. Window and door screens have been provided for the barracks and other buildings, with the result that there has been practically no malaria during the last year.

NEW YORK, N. Y.

The commanding and junior officers' quarters at New York were connected with the central Marine Corp's heating plant at that post, and various minor improvements were made to the barracks.

NORFOLK, VA.

Officers' quarters sufficient to accommodate 10 additional officers, for which special appropriation was provided in the act approved June 24, 1910, amounting to $47,500, were erected under contract with R. H. Richardson & Son, and will be ready for occupancy in a short time. One of these houses is intended for eight bachelor officers, and both of the buildings have been connected with the yard sewerage and lighting systems. The parade ground has been greatly improved and cement walks were laid. Bids will be opened in the near future for a new sump pit at this station.

PHILADELPHIA, PA.

In the act approved June 24, 1910, Congress appropriated the sum of $70,000 for the erection of one commanding officer's, one double junion officers', and one bachelor officers' quarters. The contract for

the erection of these quarters was awarded on July 31, 1911, and they are now about completed and will be ready for occupancy as soon as furniture is installed. The water, sewer, and electric lighting systems for the Marine Corps' buildings have been connected with the yard service. The grounds around the buildings are being graded and this work will be continued from time to time when money is available from the regular appropriations. In the naval appropriation bill for the fiscal year beginning July 1, 1912, there is a provision for erecting an additional barracks building at this post at a cost not to exceed $175,000, and preliminary plans and specifications for this building are now being prepared by the Bureau of Yards and Docks, Navy Department, on suggestions furnished by the Quartermaster's Department of the Marine Corps.

PORT ROYAL, S. C.

This station, including the buildings and public property belonging to the Marine Corps, was formally turned over to the Navy Department and is now used as a naval disciplinary barracks, and the expense of maintenance is borne by the Navy Department.

PUGET SOUND, WASH.

In the act approved March 3, 1909, provision was made for a new barracks building and a contract entered into for its erection on May 29, 1911, at the contract price of $135,128. This building was turned over to the Marine Corps by the contractor and accepted May 30, 1912, four months prior to the date specified in the contract. A large amount of grading and clearing has been found necessary owing to the fact that the plat of ground where the barracks is located was practically a wilderness. This work is being done as rapidly as the appropriations will permit. The old barracks building at this station has been turned over to the Navy for use as a disciplinary barracks, and equipment for about 120 men was left therein at the time of transfer. The new officers' quarters have been provided with the necessary furniture and screens.

CAMP ELLIOTT, PANAMA.

The buildings and grounds at this post are in a satisfactory condition, considering the age of the old French houses. Considerable damage was done to the buildings in May, 1912, by a severe hurricane, and repairs were made out of current appropriations. No unusual repairs or improvements were made except what was necessary for the upkeep of the buildings and grounds, which is considerable in the course of a year, owing to the severe climatic influences of the tropics. In view of the duty assigned the Navy in connection with the frequent disorders occurring in Central American and West Indian waters, it is considered very desirable that a considerable marine force, fully equipped and properly trained for expeditionary service, be retained on the Isthmus. As soon as the canal is flooded it will be necessary to abandon the site now occupied by the Marine Corps, and during the past year a very desirable site on the Isthmian Canal Zone has been allotted for the use of the Marine Corps; and it is earnestly recommended that the necessary steps be taken to prepare the new site for occupancy and to erect the necessary buildings. In

this connection it is suggested to the department that the work of construction will be considerably less expensive prior than after the canal is opened.

On June 30, 1912, the strength of the command at Camp Elliott was 14 officers and 381 men, a shortage of 1 officer and 49 men. On August 6, 1912, a battalion consisting of 10 officers and 338 men was transferred to Nicaragua for duty.

GUAM.

The marine command at Guam consists of 5 officers and 104 men, and from reports on file at these headquarters it appears that the health of the command has been excellent during the past year. As at many other posts of the corps, the barracks accommodations are not sufficient for the number of men required at the post. The commandant of the station has recommended that the detachment be increased by 1 officer and 50 men, but no officer or men are available for this increase.

GUANTANAMO.

In July, 1912, this command was increased to 2 officers and 100 men.

Minor repairs have been made to the buildings temporarily occupied by the Marine Corps at this station, including painting throughout, and doors and windows have been screened. No definite action has as yet been taken toward expending the $10,000 provided in the act approved March 2, 1907, for the erection of a marine barracks at Guantanamo.

In view of the frequency with which Deer Point is used as a camp site for the Navy or Marine Corps, it is recommended that as soon as practicable the wharf and roads be improved, that storehouses be erected, and the water supply increased.

HONOLULU, HAWAII.

In the act approved March 3, 1909, Congress appropriated $185,000 for barracks and quarters at the naval station, Pearl Harbor, Hawaii. Under date of March 19, 1912, after due competition, contract for the construction of these barracks and quarters was awarded to the Spalding Construction Co., Portland, Oreg., and it is expected that the buildings will be completed and ready for occupancy on or about June 17, 1913.

On June 30, 1912, the strength of the marine battalion at Honolulu consisted of 7 officers and 164 men, a shortage of 1 officer and 47 men, and when the new barracks are completed it is considered that this force should be considerably increased.

PEKING, CHINA.

Reports show that the condition of affairs in this command is most satisfactory. Various minor repairs and improvements have been made in the barracks and quarters, and the legation defenses have been increased.

Owing to the conditions of unrest prevailing in China during the past year, it became necessary to increase the regular legation guard by one company. It is now composed of 8 officers and 213 men, a shortage of approximately 18 men.

PHILIPPINES.

The strength of the marine brigade in the Philippines on June 30, 1912, was 39 officers and 1,080 men, a shortage of 10 officers and 76 men.

Owing to the revolution in China, on October 24, 1911, a battalion of 15 officers and 362 men, under command of Maj. Philip M. Bannon, United States Marine Corps, was embarked on the U. S. S. *Rainbow* at Olongapo, and on December 7, 1911, an additional company, consisting of 3 officers and 90 men was added to this battalion.

The commanding officer of the marine brigade in the Philippines, in his annual report, states as follows:

> It is understood that the *Rainbow* is held at this station primarily for expeditionary purposes and for use in connection with the advanced-base outfit, but that vessel is not large enough to accommodate an expeditionary force of a considerable size, and she has little or no sleeping accommodations for troops.

As one of the principal duties of the marine brigade in the Philippines is to serve, in case of necessity, as an expeditionary force in Asiatic waters, it is recommended that, if practicable, this condition be rectified, as it may be necessary for the expeditionary force to remain for months at a time on board the transport.

Minor repairs and improvements have been made to the barracks and quarters at Cavite and Olongapo so far as money available for the purpose permitted; but, as stated in my last annual report, the accommodations for both officers and men are far from what they should be in order to insure the health and comfort of the commands.

In connection with this the department's attention is invited to the fact that the expansion of the naval station at Olongapo will probably require in the near future that the site now occupied by the Marine Corps buildings be vacated for yard purposes, which will necessitate the erection of buildings capable of housing a regiment with its stores and one advanced-base outfit on the site originally allotted to the Marine Corps.

As a result of Manila Harbor improvements certain lots of reclaimed land in the Manila port district were set aside for the use of the Marine Corps. In view of the desirability of the site and of the fact that if the Marine Corps does not avail itself of the opportunity to acquire it, the allotment will probably be withdrawn and the land assigned to other purposes, an item of $200,000 for the purchase of this site and the erection thereon of a headquarters building and depot of supplies has been included in the preliminary estimates of the Quartermaster's Department for the fiscal year beginning July 1, 1913.

WITHDRAWAL OF MARINE GARRISONS.

In accordance with the orders of the department, the marine garrisons at Sitka, Alaska, and the naval hospital, Yokohama, Japan, were withdrawn, the former on March 18, 1912, and the latter on July 9, 1912.

W. P. BIDDLE.

REPORT

OF THE

SECRETARY OF THE INTERIOR.

DECEMBER 2, 1912.

SIR: My last annual report contained a number of suggestions and recommendations of changes in legislation and in administrative methods affecting the Department of the Interior. I am pleased to be able to report that substantial progress has been made in both of these directions. I regret that, largely through failure of appropriate legislation, it has not been possible to accomplish more.

GENERAL REVIEW AND RECOMMENDATIONS.

In view of the existing political and legislative conditions, it did not seem desirable during the past year to press further the suggestions made in my last annual report with regard to comprehensive departmental reorganization. At the request of chairmen of committees of Congress and of other members most of the other suggestions and recommendations in my previous report were embodied in definite bills drafted in the Department and afterward introduced either in the Senate or House of Representatives, and some of the most important measures have now been enacted into law.

Some conception of the legislative work affecting the Department of the Interior may be formed from considering the fact that more than one thousand reports on pending bills have been made up to this time by the Department to the present Congress. While some of these reports were formal, many of them were of great importance and difficulty and many of the bills were considered at committee hearings attended personally by the Secretary or other representatives of this Department.

A COMPREHENSIVE CLASSIFICATION POLICY FOR THE PUBLIC DOMAIN.

My previous report pointed out that the chief function of the Department of the Interior has been, generally speaking, the administration and disposition of the lands and natural resources held directly or in trust by the Nation. It called attention to the lack of adequate laws for the proper administration and disposition of these lands and natural resources, especially as they are embraced within the public domain. Its principal recommendation was that all of our public lands should be classified according to their respective

characteristics and appropriate uses, and that they should then be administered or disposed of in accordance with their real characteristics under the classification. This suggestion of comprehensive land classification and of administration based upon such classification met with much approval upon the part of individual Members of Congress and others, but the subject was given no serious consideration at the last session, and I earnestly renew my recommendation with respect to it. The existing statutes attempt to recognize in a very general and ineffective way the fundamental differences between the different classes of agricultural land still remaining in the public domain. Nevertheless, land adapted to dry farming, land adapted to ordinary cultivation without irrigation, and land requiring irrigation each presents differences in method of cultivation and admits of appropriate differences in the rules with regard to residence, which the present system is not flexible enough adequately to recognize. Greater difficulties, however, are found in the present laws or lack of laws with regard to other parts of the public domain, especially our timber lands, our grazing lands, our water-power and reservoir sites, and our lands containing coal, oil, gas, asphalt, potash, nitrates, and phosphate.

There is quite general misapprehension as to the scope and effect of the act under which these important classes of lands and their resources are now withdrawn from entry under the ordinary homestead or mining laws. The Withdrawal Act, as amended at the last session of Congress in accordance with the recommendations of this Department, furnishes adequate authority for the withdrawal of such lands and resources "for water-power sites, irrigation, classification of lands, or other public purposes." The difficulty is that once withdrawn and classified such lands can not be restored to entry under laws which will promote development, prevent mere exploitation, and protect the public interest. Partial exceptions to this general statement exist with respect to coal lands, which can be classified and, after a valuation has been placed upon them by the Geological Survey, are made subject to public entry upon payment of the valuation. Water-power sites can be developed under revocable permits. Lands suitable for reservoir sites and for irrigation can be withdrawn for the use of irrigation projects under the Reclamation laws or the Carey Act. Useful as are these methods of development after withdrawal, they do not adequately cover the field or permit appropriate development even of these particular kinds of lands, and the remaining classes of lands above noted are practically without any statutory provision for their appropriate development and use. Oil, gas, asphalt, potash, nitrate, and phosphate lands once withdrawn must remain locked up unless opened to exploitation under the general mining laws applicable to and intended for metalliferous minerals or placer deposits. My previous report pointed out that "it is the conviction that

exploitation under the guise of development has not been effectively prevented, which has led to the great public movement for the conservation of our national resources," and that "if we can frankly adopt and put into force laws which will absolutely prevent mere exploitation, we can far more safely enact liberal laws and regulations to encourage legitimate development." To this end specific recommendations were made for laws which should be adopted even if Congress were not prepared to authorize a comprehensive classification policy. The chief of these recommendations were probably the adoption of constructive legislation with respect to water-power development and control and the comprehensive application of the leasing system to the development of our public coal, oil, gas, asphalt, nitrate, potash, and phosphate lands, with appropriate provision for the protection of prospectors during a reasonable exploration period preliminary to the leasing of the land. It was pointed out that the enlarged application of the leasing principle to the public domain generally would more effectively promote development and protect the public interest than the present system, especially as applied to lands of the classes just mentioned. It was earnestly recommended that laws should be enacted which would permit the Government to sell the mature timber upon the public domain and thereafter to open to homestead entry such portions of the land as are available for agricultural uses, retaining and reforesting in Government hands the land upon which timber can be raised, but which is not adapted for future agricultural uses. Vast tracts of this latter sort are now being purchased in the Appalachian Mountains by the National Forest Reservation Commission to protect navigable streams and prevent disastrous soil erosion. It is inexcusable to permit public lands of this character to be acquired now by private interests, when we are spending public moneys to buy just such lands elsewhere, and may have to repurchase in the future the very lands from which the Government is now parting. If statutes are enacted to provide for such classification and disposition of timber, it is evident that the Timber and Stone Act will be superseded and should be repealed, as should also be repealed the act of June 3, 1878, authorizing the cutting of timber on mineral lands, and the act of March 3, 1891, whereby provision is made for the issuance by this Department of permits for the cutting of timber on nonmineral lands. The adoption of a grazing lease law for the public range was also urged for the protection of the range itself from impending destruction and for the protection of the legitimate interests of both the sheep and the cattle owners.

While these general recommendations have not been adopted and the country must still wait for a comprehensive classification policy for the public domain, some progress has in fact been made in this general direction.

HOMESTEAD LAWS.

One of the most important recommendations made in my previous report was the amendment of the homestead law so as to reduce the period required for actual residence, provided the reduction was accompanied by definite requirements as to the actual and progressive cultivation and improvement of the ground. The specific recommendation was that the homestead settler should be excused from the necessity of residing upon his land during the first two years after entry, provided he substituted for residence during that period the improvement and cultivation of a substantial portion of the ground, to be followed by actual residence and progressive cultivation during the remaining three years of the established five-year homestead period. I am still of the opinion that this recommendation, based as it was upon personal examination of conditions in certain portions of the public-land States, and upon conferences and correspondence with actual settlers, would have better met many of the existing conditions than the statute which was in fact adopted. Nevertheless, Congress preferred to reduce the homestead period to three years and to excuse the settler from residence during not more than five months of each of these years; and as a result of the interchange of views between the congressional committees and the Department the act as passed (June 6, 1912) was made to conform to the important fundamental principles discussed in my previous report. It met the approval of this Department and was signed by you. It established the general rule requiring definite and progressive cultivation, and at the same time it gives to the Secretary of the Interior the power to reduce these requiremnts where the character and condition of the land justify such action. The Department is thus enabled to make the laws and the administrative regulations more nearly fit actual conditons as they exist, so that these regulations may be just as strict in the prevention of nonresident exploitation as they are liberal in the encouragement of the bona fide settler. The law is being administered in this spirit and for this purpose and should prove of great benefit in the further development of the public-land States.

General legislation permitting the disposition under the agricultural-land laws of the surface of lands believed to contain deposits of oil and gas was not enacted as recommended, but a statute permitting such entries upon public lands in Utah was passed. The serious defect in the Withdrawal Act of June 25, 1910, which was pointed out in the last annual report of this Department, has been cured by the adoption of the amendment there recommended, so that lands withdrawn for important public purposes like water-power sites or storage reservoirs can no longer be entered under the mining laws of the United States, except so far as these laws apply to metal-

liferous minerals. Potash and nitrate withdrawals are also thus protected.

The homestead commutation law has not been repealed, and no limitation has been fixed within which such scrip as military bounty, soldiers' additional homesteads, etc., may be located and lands acquired thereunder. This should be done.

RECLAMATION ENTRIES.

Among my recommendations of legislation affecting the Reclamation Service were: That title should pass to the settler in advance of full payment of his share of the construction cost, with reservation of a lien to secure ultimate full payment; and that the duty of collecting such payments should be transferred from the General Land Office to the Reclamation Service. Both changes were effected by the act of August 9, 1912 (37 Stat., 265), providing for patents on reclamation entries. This statute embodied, with slight modifications, parts of a bill to amend the reclamation law which was drafted in the Department and introduced in both Houses (S. 6272 and H. R. 20490). Under it a homestead settler, who has performed the duty of residence (3 years), reclamation and cultivation (half the area of his entry), and has paid all sums then due the United States on account of his land or water right, may have a patent forthwith, whereas hitherto he would have had to wait until he had also paid all the 10 annual installments of the building charge. Under the new statute he gets a marketable title quickly, and the unpaid balance of his share of the cost of the works becomes a first lien on his land. He can therefore mortgage it, subject to the Government's lien, and thus obtain the capital necessary to develop it. The private land owner who buys a water right from the Reclamation Service is put upon exactly the same footing as the homestead entryman with respect to marketable title, reclamation, and cultivation. The lien of the Government is enforceable by sale, and 8 per cent per annum is chargeable upon all sums in default. Dues for operation and maintenance charges are expressly covered by the security of the Government's lien. Pending full payment of the building charges the holdings of water-right purchasers for private lands and of entrymen and patentees of public lands are restricted to one farm unit, with provision for the forfeiture of any excess. Desert-land entries embraced within reclamation projects and securing water from the project works are placed on a like footing by a clause in the deficiency appropriation act of August 26, 1912 (37 Stat., 610). The act of July 24, 1912 (37 Stat., 200), authorizing the partial assignment of desert-land entries in reclamation projects and requiring such assignments to conform to

farm units established by the Department on the application of the entryman, still further harmonizes the status of homestead entrymen and desert-land entrymen within reclamation projects. The fourth section of the said act of August 9, 1912, authorizes the designation of bonded fiscal agents or officers of the Reclamation Service to collect the water charges hitherto payable to the receivers of the local land offices, which are often not sufficiently near or in touch with the reclamation projects to make effective cooperation with the project officials possible. Much administrative improvement will certainly result from the adoption of these recommendations by Congress.

COAL-LAND LEASES.

As already noted, it has thus far been impossible to secure serious attention in Congress for the passage of a comprehensive leasing law for coal, oil, and the other minerals heretofore mentioned. Much encouragement, however, is to be found in the favorable consideration by the Senate Committee on Public Lands of the bill for the leasing of coal lands in the Territory of Alaska, which was in part the result of conferences between representatives of the American Mining Congress and the Department of the Interior. This bill was favorably reported to the Senate, but too late in the session to secure the consideration necessary for its passage. It is earnestly to be hoped that a bill of this character will be enacted at the present session of Congress. Meanwhile, however, the passage of Private Resolution No. 4 has enabled the Department of the Interior to make a practical application of the leasing system to coal lands in the State of Wyoming. The facts are as follows:

In May, 1909, indictments were returned in the United States court for the district of Wyoming charging certain persons with conspiracy to defraud the United States by the attempted unlawful acquisition of coal lands in the Lander, Wyoming, district, amounting to 9,500 acres, included in 32 coal cash entries. Most of the persons indicted were residents of the State of New York. The Owl Creek Coal Company was one of the corporations connected with the transaction.

The General Land Office directed proceedings against the entries with a view to the cancellation thereof. The local land office at Lander, by a decision rendered in June, 1910, held these entries for cancellation. This decision was, on appeal, affirmed by the Commissioner of the General Land Office on February 13, 1911. On appeal to the Department this decision was affirmed, and all of these entries have now been canceled.

While the cancellation proceedings were pending two bills were filed in the United States court in Wyoming praying an injunction

to restrain the mining of coal upon the lands involved in the litigation pending the determination thereof. The Government was successful in both of these suits, but upon stipulation the court allowed the defendants to continue their mining operations upon the payment of a royalty of 6½ cents per ton on all coal mined.

By Private Resolution No. 4, approved August 1, 1912, the Secretary of the Interior was authorized by Congress to allow the Owl Creek Coal Company to continue the operation of the mine or mines upon any of the lands embraced in these entries upon such conditions and under such rules and regulations as he might prescribe. The conditions, rules, and regulations thus authorized were prescribed in the form of a lease, which was executed for and on behalf of the United States and the Owl Creek Coal Company on the 29th day of August, 1912. Its principal provisions are as follows:

Term.—The lease is made for a period of 10 years from date of execution (Aug. 29, 1912), and gives the lessee a preferential right of renewal for successive five-year periods up to a total of 30 years from date of execution.

Estate.—The lessee is given the right and privilege of mining and extracting the coal and of disposing of the same, subject to the terms of the lease.

Acreage.—The tract embraced in the lease comprises 2,480 acres of the 9,500 acres involved.

Rental.—The lessee is to pay rent at the rate of $1 an acre, or $2,480 annually, in advance, payable on the 1st of July of each year. This rental is to be credited upon royalties due under the lease for coal mined during the year, for which rent is so paid in advance, or, in the discretion of the Secretary, upon royalties due for succeeding years.

Royalty.—The lessee is to pay a royalty on each ton of 2,000 pounds run of mine, as follows: Six and one-half cents per ton for the first five years, 8 cents per ton for the second five years. The royalty payable thereafter is to be fixed at the beginning of each subsequent five-year period for which the lease is renewable. The lease provides that the royalties due shall be payable in three installments, as follows: On or before February 1, for all coal mined during the months of October, November, and December; on or before May 1, for all coal mined during the months of January, February, and March; on or before November 1, for all coal mined during the months of April, May, June, July, August, and September.

Operating conditions.—The lessee agrees to conduct all mining operations in accordance with the regulations of the Secretary of the Interior, and subject to the examination and inspection of the Federal Bureau of Mines, and to comply with all directions of that bureau for the prevention of unnecessary waste of the coal, the safeguarding of the lives of miners and employees, and the efficient operation of the mine.

Removal of property.—The lessee is given the right to place upon the property certain necessary personal property for use in the operation of the mine, such as buildings, structures, and machinery, and the further right to remove, upon the expiration or forfeiture of the lease, all such property belonging to it, except buildings, structures, and mine timbers and supports in place, provided that in the removal no injury is done to the realty or the mine, so that it can again be equipped for mining operations.

Assignment of the lease or any interest therein is prohibited.

The lessee is given the right to use the surface of the leased land for necessary purposes in connection with the conduct of mining operations.

Forfeiture provisions.—The Secretary of the Interior has the right to forfeit the lease upon the lessee's failure to comply with its terms and conditions, including the nonpayment of rents and royalties when due, after giving proper and reasonable notice. Forfeiture shall not be enforced because of cessation of work caused by strikes, loss of buildings or machinery through fire or unavoidable accidents; but the happening of any such event is not to excuse the payment of rents or royalties due or prevent a forfeiture for a failure to pay the same.

MINING LAWS.

The thorough revision of our mining laws which was recommended was seriously discussed, but definite action has not been taken. Meanwhile, however, the recommendation that the use of the power of attorney for making mining locations should be curtailed and safeguarded has been carried out by the passage of a statute limiting the number of placer-mining claims which may be located in Alaska by power of attorney, fixing the maximum area of such claims hereafter located by associations at 40 acres, and requiring a minimum of $100 worth of labor to be done upon every placer-mining claim in said Territory annually until a patent has been issued therefor (act of Aug. 1, 1912; 37 Stat., 242). Action has not been taken with regard to the recording of notices of mining locations and requiring mineral locators to come forward with their applications for patent within a specified time; nor has action been taken to abolish the law of the apex without prejudice to existing rights. These matters should receive prompt consideration even if a comprehensive revision of our mining laws is not now undertaken.

It is becoming increasingly evident that the lode-mining law needs changes in one respect, at least. The law at present does not provide for the creation of any rights in supposedly mineral land, except by the issuance of patents, and in that regard Congress has provided that a patent can follow only on a legal location and has said "but no location of a mining claim shall be made until the discovery of the vein or lode within the limits of the claim located." As long as Congress desires to adhere to the policy at present embodied in statute law of disposing of mineral land absolutely, the law quoted above tends fairly well to the development of mineral properties where the ore can be discovered at or near the surface of the ground, but it seems to be ill calculated for a district where, as is the case notably in some of the copper-mining districts, the ore lies at depths of hundreds and sometimes thousands of feet. The expense of actual discovery of the vein or lode within the limits of any particular claim in such cases involves deep exploration, either by drilling or by the sinking of a shaft from the surface, or the extension of a tunnel into the claim. Either of these operations may involve great expense, and it has been repeatedly urged on the Department that

investors are reluctant to spend the money required without further assurance than the law as it reads at present can give them. On this ground the Department has been strenuously pressed to so construe the law as not to require an actual discovery of the lode which is supposed to exist within each claim, but to patent the claims upon evidence of the existence of mineral at or near the surface wholly disconnected with the supposed lodes below and of no value in itself either present or prospective, it having been further urged that in these cases it was a matter of geological inference that ore bodies did exist far below the surface. It is obviously the duty of the Department to carry into effect the intention of Congress expressed in statutory form. Congress having said that no lode claim should be patented without discovery of the vein or lode, within the limits of the claim, it would be an evident usurpation of power for this Department to patent lode-mining claims without proof of actual discovery. The frequently repeated assertions that the recent rulings of the Department have overturned interpretations placed upon the law for thirty years seem utterly without foundation, as is pointed out in the recent departmental decisions. On the contrary, had the Department decided that it could dispense with actual discovery it would have overturned the practically unanimous holdings both of courts and of the Department ever since the enactment of the lode-mining law. Doubtless in some cases claims have been patented where there was little or no proof of actual discovery, but the patenting of such claims is evidently to be laid to a misapprehension of the facts by employees of the Land Office, and not to a misconstruction of law by the Department.

It seems, however, possible by a change in the law to keep in force the policy of the Government expressed in the mining law of rewarding the actual discoverer of valuable veins, while at the same time giving such protection during the work preliminary to actual discovery as would make it possible for capital to invest, taking no more risk than that inherent in the question whether there is or is not in fact valuable mineral in the place where it is sought. I suggest that the law should be amended so as to give a prospector, for a term of years, an exclusive right of possession and of prospecting within a limited area of land. In case actual discovery were made within the time given, patent would issue. The prospector should be obliged to perform a reasonable amount of work during the existence of the permit in order to make evident his good faith in attempting to find mineral within the limits of the claim. He should, however, be given the right, by proper proceedings, to settle disputed questions of intervening claims, both in case of conflict with other mineral claims and also cases of conflict with agricultural claimants, so that he might at the earliest possible moment know whether or not his title would be absolutely clear upon his making discovery.

The only alternative suggested to this plan, apart from the evidently impossible one of accepting as evidence of discovery something which is clearly not such evidence, would be for Congress to amend the law so as to permit the issuance of patents to mining claims upon proof of the existence of valuable mineral within the claims by geological inference. The objections to this are many. In the first place, it is evident that no geological inference can be absolutely sure. This is particularly clear in the case of copper deposits at great depth, for it was admitted in oral argument before the Department in a case where a large number of claims were applied for, that it was impossible for the claimants to state that there was in fact any copper ore at all under the surface of any particular claim; all that they asserted that they could be sure of was that somewhere beneath the surface of the large number of claims there was a large amount of such ore. Another objection of perhaps much greater weight is that to substitute geological inference for the actual discovery of the vein or lode as required by the present law is to give to the geologist, or the man financially able to employ skillful geologists the reward which it has been the policy of the law up to now to extend to the prospector or actual discoverer. It would also follow that a wealthy man could, without any actual development of the mineral resources of the country, obtain patents for and thus monopolize large districts of valuable mineral land.

TRANSPORTATION AND COAL DEVELOPMENT IN ALASKA.

As pointed out in my previous report, the whole development of Alaska is waiting largely upon the passage of suitable legislation for the development of its transportation facilities and of its coal lands. I have heretofore urged as vigorously as was in my power the immediate relief of Alaska in the following particulars:

First. The construction by the Federal Government of a central trunk line railroad from tidewater through the Matanuska coal fields to the Tanana or Yukon Rivers.

Second. The passage of a liberal but carefully guarded leasing law for the development of its mineral resources and especially its coal lands.

Third. The reservation of a sufficient amount of these coal lands to provide for future needs of the Navy and the mining of this coal by the Government for this purpose.

Fourth. More liberal appropriations for aids to navigation, such as lights and buoys.

Fifth. More liberal appropriations for the construction of roads and trails.

Sixth. The adoption of a form of Territorial government better adapted to its remote situation and peculiar local conditions.

The sixth and last of these recommendations is the only one which Congress has actually put into effect. A Territorial legislature with limited jurisdiction has been created for the Territory and will undoubtedly give its attention to many measures of local relief, for which bills were drafted in this Department and urged upon the last session of Congress, but were not passed. These bills related to such matters as the protection of the public health, the registration of marriages, births, and deaths; the supervision of banks; and other similar subjects. The appropriations for the improvement of navigation and for the construction of roads and trails were not increased by Congress as they should have been. On the other hand, substantial progress has been made in the consideration of the needs of the Territory for the construction of railroads and for the mining by the Government of coal for the use of the Navy. A Government railroad has not been authorized, but a provision was inserted in the Territorial government bill authorizing the appointment of a commission consisting of an Army engineer, a Navy engineer, a representative of the Geological Survey, and a civil engineer who has had practical experience in the construction and operation of railroads, but who has not been connected with any of the roads in Alaska. This commission was promptly appointed and proceeded to Alaska, where it has remained as long as the season would permit, engaged in a personal examination of the Territory with a view to making to the present session of Congress as comprehnsive a report as possible within the available time. Following my annual report and after a personal visit to Panama, I presented before the appropriate committees of Congress the suggestion that much valuable railroad material and equipment was being released from further use in the construction of the Panama Canal and would be available for utilization in Alaska. The suggestion is supported by officials at Panama and by many others and seems worthy of careful consideration by Congress at the earliest possible date, so that this material and equipment shall not be sacrificed at forced sale when it would have a far greater value for use in Alaska.

The Navy Department is pressing for prompt consideration its urgent need of adequate coal reserves on the Pacific coast and especially in Alaska. It secured from the last Congress an appropriation of $75,000 for mining and testing Alaska coal. This work was undertaken by the Department of the Interior through the agency of the Bureau of Mines. It was hoped that some investigation of the Matanuska coal fields for this purpose would be possible, but the season was so far advanced when the appropriation became available that work was necessarily confined to the Bering field, where a coal mine has been opened and coal for experimental use by the Navy under practical working conditions is being mined and transported to tide

water. This work will furnish a practical test not only of the coal itself, but of the conditions under which Alaskan coal must actually be mined and made available for use. The Alaska coal-leasing bill, which was favorably reported by the Senate Committee on Public Lands, has the support of a part, at least, of the entrymen whose claims are still in controversy with the Government. It proposes to give all of the entrymen interested in still pending entries, who are not involved in pending criminal proceedings or have not been found guilty of criminal acts in connection with their claims, a preference right to lease the lands in which they are respectively interested. During the year progress has been made in the disposition of these claims. The Cunningham claims and many others have been definitely canceled. Investigation of the remainig claims is practically completed, and they are all being set for hearing and disposition at the earliest practicable dates. For some time action was postponed in those claims which were involved in criminal proceedings for the reason that it was thought to be fairer to the entrymen and to the Government to allow the criminal cases to be disposed of before action on the civil side. Some objection to this course has, however, developed among the entrymen, and the delays met with in getting the criminal suits to trial have led the Department to push for hearings in all of the pending claims so that the civil rights of the parties may be determined as promptly as possible. At the same time the criminal cases are being expedited and set for trial so that the innocence or guilt of the defendants may be promptly and definitely determined.

WATER POWER.

There is no more important subject now pending before Congress and the country than the adoption of a definite and comprehensive water-power policy, both with regard to streams upon the public domain and navigable streams not on the public domain. My previous report presented at some length the present views of this Department and urged that the whole subject of water-power development and control should receive the immediate consideration of Congress to the end that constructive legislation should be adopted without unnecessary delay. During the past year the subject has received much attention in Congress and elsewhere. The hearings before the National Waterways Commission were especially important and resulted in a unanimous report[1] which marks at least a definite step forward toward a constructive water-power policy. Bills have been introduced providing for the definite adoption of such a policy with respect to public lands. The passage of two bills by Congress authorizing dams in certain navigable streams and the discussions over

[1] Senate Document No. 469, 62d Congress, 2d session.

these bills and over the forceful messages in which you vetoed them have clearly pointed out the necessity for amendment of the General Dam Act and have suggested the amendments which would be appropriate. It is earnestly hoped that legislation will be promptly adopted with respect to both of these branches of water-power development which will encourage vigorous development without the sacrifice of public interests.

When it became apparent that Congress was not likely to act with respect to water-power sites upon the public domain, a series of conferences was arranged between the representatives of the Department of Agriculture and the Department of the Interior for the purpose of drafting a comprehensive revision of the regulations of these two departments with respect to permits for water-power development in the national forests and on the public domain generally. The revised regulations were put into effect by the Department of the Interior on August 24, 1912, so that their effect might be carefully considered by those who are interested in water-power development; and on November 18, 1912, a largely attended conference with representatives of important water-power interests and of the State conservation, water, and railroad commissioners of California was held in the office of the Secretary of the Interior for the purpose of discussing the relations between the State and National Governments with respect to water power, and especially of considering such modifications in the laws and regulations as might be suggested in order to coordinate the functions of the Nation and the States and make the regulations, whether state or national, sufficiently liberal to encourage vigorous development and at the same time to protect adequately the public interests. The conference demonstrated the feasibility of effective cooperation for the reconciliation or adjustment of the different interests, state and national, public and private. Many helpful suggestions were made, which are now under consideration.

The fundamental purpose of a rightly considered water-power policy is the encouragement and stimulation of the development and use of this great natural resource for the benefit of the public and along lines which will protect and promote the public interest. Its object is development, but development for the benefit of the public. The first public interest is that the water power shall be developed and utilized, but some forms of development and utilization are obviously better calculated to promote the public interest than are other forms. It is therefore essential that we should determine what form of development will best promote the public interest. Our present economic and social institutions are based upon the theory that the welfare of the community is to be promoted largely through the opportunities of personal gain offered to the individual members

of the community. It is through these opportunities of personal advantage that we expect to stimulate the ambition and the energies of private individuals whose activities in the mass promote the welfare of the community and advance the prosperity and the happiness of the people as a whole.

So far as government itself does not undertake the development of water power it is therefore necessary and desirable that we shall offer to those private interests which do undertake its development a sufficient opportunity for profit and a sufficient protection of their investment to secure the largest measure of development for which there is a present market, or for which a market can profitably be created. It must be equally apparent, however, that to the extent to which we offer an unnecessary inducement we are depriving the community of the very benefits upon which the present theories of industrial society depend. We are failing to obtain for the community the advantage on account of which we offer to the individual the opportunity for private gain. It is true that it would be a mistake to undertake too nice an adjustment of the public and the private interests involved and that the benefit of every real doubt should be given to the private investor and developer so that we may make sure that he is given a sufficient inducement to undertake the enterprise. At the same time it is not every investment of capital in such enterprises that must be completely protected; it is not every such enterprise that should be assured a profitable operation. If there is no risk incurred by unwise investment or inefficient management, there will be no adequate incentive for wise investment and efficient management.

Above all we must make certain that those who receive special privileges connected with water-power development shall in fact proceed by appropriate degrees and within appropriate times to develop the available water power to its highest capacity, having due regard to the possibilities of marketing the product. We must make certain that the electric energy thus created shall be made available to the community in appropriate ways at appropriate prices. If it is not to be used for the benefit of the community, but is to be devoted directly to the private purposes and personal advantage of the permittee, some method must be found by which the public will receive its share of the profit which the permittee may make over and above that which is a necessary and reasonable inducement for his investment. There must be appropriate provisions in the permit or in the law under which the permit is issued for the effective enforcement of such conditions as are essential to the public interest.

The theory of our present law in these particulars appears to be that the only way in which the public interest can properly be protected is by providing that the permit may be revoked at any time

by the official who grants it. My previous report discussed at some length the reasons why this theory neither promotes development nor protects the public interest in an effective manner. Instead of meeting directly and adequately the important economic questions involved; instead of attempting to state the essential conditions which should be asserted for the protection and benefit of the public; instead of fully authorizing the officials who grant these permits to limit and define these conditions so that the permit may be revoked only for a breach of the conditions thus established by the statute or by official regulations, our present law seeks to avoid this responsibility by making the permit revocable at any time and without specific reason. So long as this provision in the law was not regarded seriously it offered little obstacle to development in the then limited ranges of hydro-electric enterprise and long-distance transmission. To-day, however, the revocable feature of the existing law is a serious and unjustifiable obstacle to the development and utilization of one of the Nation's greatest natural resources. It should be stricken out of the law, but it should be stricken out only if there are inserted in its place statutory provisions which will define or authorize the appropriate executive agency to define by regulations the conditions and limitations upon which the permit is issued and for a breach of which it shall be canceled.

We must adjust two classes of relations and interests. We must adjust the relations and interests of the Nation and the States; we must adjust the relations and the interests of the public and the permittee. These adjustments are not without difficulties, but they are entirely practicable, and the general lines upon which they should be accomplished are clearly apparent.

It would seem to be axiomatic that where any governmental agency, whether State or Federal, owns or controls a natural resource that agency should take such steps and adopt such policies as will insure that this natural resource is being utilized for the benefit of the community. If the particular agency, State or Federal, is called upon to expend moneys for the protection or improvement of the resource and the resource itself can, without detriment to the community, be made to produce revenues out of which such expenditures can be paid, this course should be adopted. The proposition thus laid down seems to be conceded, reluctantly in some cases but freely in others, by those who are interested in water-power development. As a rule also they concede further that if water power is being developed and used directly by the permittee for its own financial profit and not as a public utility, the particular governmental agency issuing the permit can and should require the payment of such substantial compensation as the facts in any given case may warrant.

Upon the other hand, however, they vigorously contend that much, if not most, of the water-power development upon navigable streams and upon the public domain is, in fact, in the nature of a public utility, in that it is devoted to the generation of electric current which is sold by the permittee for general consumption by the public for light, heat, or power. They now state frankly that this development should be treated as a regulated public monopoly. Some of them contend that for this reason no compensation whatever should be exacted by the Government which grants the permit, but on the other hand those private interests whose representatives are really candid are prepared to admit that public regulation of these utilities is, generally speaking, not yet efficient, and that to the extent to which it fails to be efficient the Government is justified in exacting compensation. They admit further that for the purpose of keeping control of the situation and upon broad general principles of public policy the Government is justified in imposing a nominal compensation even in cases where public regulation appears to be reasonably effective, and that provision for periodic readjustment of this compensation will be a useful check in securing such efficient regulation. Indeed, the only controversy of importance appears to be whether the Federal Government or the States shall control the granting of water-power permits and shall collect the compensation.

So far as concerns water-power concessions upon streams which are not navigable, the Federal Government is directly concerned to-day only where the application is for the use of some portion of the Federal domain. The important question is whether the Federal Government should retain its control over such power sites and upon what conditions the concession shall be issued. The suggestion is made frequently by those who are in one way or another representing either present or future investment in water-power development that such power sites and their control should be turned over to the respective States in which they are situated. It is suggested that in some way or other a failure to do this is a usurpation of Federal power and an unfair discrimination against the Western States. It is interesting, however, to note that the ordinary citizens of these States—are not at all concerned over Federal usurpation or unjust treatment. They recognize that the Federal Government has full legal power to dispose of the public domain as wise policy may direct.

They do not fear Federal usurpation, but seek Federal cooperation in supplementing State and local powers, so that the natural resources shall be utilized for the public benefit primarily of the locality in which these resources are situated, and thus ultimately for the benefit of the Nation as a whole. They suspect that the real purpose of those who urge the turning over of the Federal domain to the States is that

they may escape the longer and the stronger arm of the Federal Government and may take advantage of the more limited resources and governmental facilities of the individual States. While some States have undoubtedly wisely conserved certain of the lands and natural resources turned over to them by the Nation, the story has too often been the acquisition of these lands and resources by special interests or individuals without adequate recognition of the public interest. There is no policy which it would be wise for any State to adopt with respect to these matters in the adoption and enforcement of which it can not be supplemented and assisted rather than retarded by the retention in Federal hands of the powers and the property now held by the Nation. It is precisely this policy of practical cooperation which should be put into effect.

There is no real conflict between the Nation and the States upon this subject. In fact, there can be no real solution of these aspects of the problem until the interests and the functions of the Nation and the States are coordinated and they are working together for the same essential ends. In general all of the streams which are susceptible of water-power development are also of great importance for domestic use, for irrigation, or for navigation. All of them depend to some degree upon protection and aid of some kind and from some source for one or more of these uses. Increasingly that source tends to be the Nation and not the States.

Theoretically the States can develop and protect the streams and the watersheds of the streams within their respective borders, and if these streams are interstate in character the States affected can unite in plans and expenditures for their joint protection and development. Practically, however, the tendency is increasingly in the direction of Federal action upon such matters. Some of the individual States are developing effective policies of water conservation, but it is the Federal Government after all which is called upon to make the chief expenditures for the development of navigation and for the protection of the forest cover around the sources and along the watersheds of both navigable and nonnavigable streams. It is the Federal Government which will be asked to build the reservoirs in which to impound the flood waters at their source so that devastation may be prevented and stream flow be made regular and beneficent. It is the Federal Government which has established and is maintaining the forest reserves by withdrawing appropriate areas on the public domain and purchasing other areas in the Appalachian and other mountains of the Eastern States. The States which are jointly interested in the disposition and development of interstate waters not only do not cooperate with each other, but are in fact antagonistic. No better illustration of this can be found than in the present attitude of State officials and some citizens of Colorado

toward the utilization of the waters of the Rio Grande for the irrigation project in Texas and New Mexico authorized by Congress partly for the benefit of these States but largely in settlement of an international controversy with Mexico.

If, then, the Nation is to perform these important functions: if it is to make these expenditures; if it is to be the arbiter and harmonizer of conflicting State interests, there would seem to be every reason why the Nation should retain the fullest measure of control necessary or appropriate to enable it to perform these functions effectively. This is none the less true because in exercising these functions the chief and controlling purpose of the Nation should be to promote the interests of the States and local communities directly affected rather than to utilize its powers for the purpose of increasing Federal revenue. Where the exercise of these functions develops water power or adds to the value of water power already existing, there can be no sufficient reason adduced why the cost of the protection and the improvement should not be repaid in whole or in part out of the values thus created, nor can there be any adequate reason why the Federal Government should pay the cost of such protection and improvement merely to turn over the revenues to the States or local communities to be used for other purposes than water-power development. Federal expenditures of this character should not be borne wholly by the general taxpayers of the Nation if the expenditures produce special local benefits of the kind described.

It is true that much of the hydro-electric energy developed under Federal permit will be sold to local communities and their inhabitants for general lighting, heating, and power purposes, and that the local communities affected are therefore vitally concerned in the character of the service rendered by the permittee and in the charges for this service. The improvement of long-distance transmission will tend to change this local interest into an interest interstate in character and this change will lead to the necessary assertion of the Federal power over interstate commerce, as has been the case in the field of railroad enterprise, but until that time comes, and except as it does come, it should be a fundamental principle of Federal water-power policy to relegate to the States and their delegated agencies, whether such agencies be the local municipalities or the public-utility commissions, the important function of regulating the service and the rates of hydro-electric public utilities. It should equally be a feature of Federal policy to utilize the revenues derived from water-power permits solely for the purposes of water development, thus returning to the local communities, not by any nice adjustment of particular expenditures to particular receipts, but as a general policy, the contributions which these communities may directly or indirectly make to the Federal Treasury. Where the local community is efficiently

regulating the rates and services of these permittees, the Federal charge should be nominal in amount, but it should be susceptible of periodic readjustment, so that official inquiry may be made into the extent to which local regulation is efficient, and if for any reason such regulation is not effective, and the permittee is enjoying an unconscionable profit, this profit may be diminished by appropriate increases of the Federal charge. Such a policy can in no way injuriously affect the legitimate interests of the private investor or the local community.

STREAM UTILIZATION.

The streams of the United States are acquiring increased value with the increase in settlement and density of population in both the East and the West. Navigation, power, and irrigation are uses recognized by statute, yet with the increased dependence upon stream utilization more attention will be paid by public and private enterprise to the various means of economizing and conserving streams in order that the uniformity and regularity of their flow, and consequently their usefulness, may be increased. The act of 1897 authorizing the creation of forest reserves in the West states as one object of such reservation the regulation of stream flow through the favorable effect upon streams of the maintenance of unbroken forest areas on their headwaters. Perhaps the most definite legislative recognition of the principle of stream conservation is contained in the so-called Weeks Forest Reserve Act (36 Stat., 961). This law appropriates the sum of $11,000,000 for the purchase of lands upon the headwaters of navigable rivers within the United States for the stated purpose of conserving navigability.

The administrative officers of the Government have kept full pace with the legislative officers in their recognition of the necessity of taking action to protect the potential usefulness of our streams by fostering constructive development, and to this end have used the powers given them by Congress. For example, under the Withdrawal Act of June 25, 1910, lands whose greatest value is for their use in the development of water powers or in the making of irrigation reservoirs have been reserved from other disposition as far as authorized in said act and are preserved for such power or irrigation use. In pursuit of the same policy the Government has reserved lands suitable for reclamation under the Carey Act in order that they may be put to such use.

In general, the destruction of the natural cover of forest or underbrush at the headwaters of streams increases the high-water flow, decreases the low-water flow, increases destructive erosion and accompanying silt deposition, and so interferes with all the uses of the stream which are valuable to the public, such as navigation, irriga-

tion, and power. This fact, which has been the subject of considerable discussion, has been clearly established by the recent investigations of the Geological Survey in the White Mountains in connection with the administration of the Weeks Act.

The theory of the Weeks Act is that the preservation of natural cover on the headwaters of streams tends to maintain the navigability of these streams, and under this act lands are now being purchased in the eastern part of the country. There are, however, areas of western lands whose situation in relation to the headwaters of streams valuable for power and irrigation is precisely the same as that of the lands now being purchased under the Weeks Act in the East in regard to streams there valuable for navigation. The fact that the Government, in pursuit of the wise policy of promoting the regularity of stream flow, is now buying lands in the eastern part of the country, the title to which should never have passed from the public, necessarily shows that public lands in the West in a similar situation should be retained by the Government in order that the streams whose headwaters they protect may be made as useful as possible. Many such lands are at present so retained in national forests.

I am informed, however, that there exist areas of public lands on the headwaters of streams in the West, and particularly in the arid Southwest, which should be withdrawn from entry because if their acquisition by private interests is permitted the usual destructive effects will follow. Careless cultivation, brush fires, or overgrazing will result in the destruction of the natural cover; erosion will become effective; the destructive power of floods will be increased; the low-water flow will be decreased; stream channels will be filled with débris; reservoirs upon them will become clogged; irrigation effected by their use will be decreased; and such power values as they may have will be greatly reduced. Such lands should be withdrawn in order to protect headwaters of streams and to prevent the necessity of future governmental expenditures in the West under the authority of the Weeks Act or some similar legislation of the kind represented by the purchases now being made of headwater lands in the Appalachian region. It is not proposed to include lands whose value for other purposes is greater than their value to the community for stream protection, and it is not anticipated that the areas thus withdrawn would be large or widely distributed.

The type of reserve thus suggested may be similar to that created directly by congressional action by the act approved February 20, 1909 (35 Stat., 641). This law withdrew from the public domain and erected into a permanent reserve certain unoccupied lands in the San Bernardino Valley, California, that were worthless except for use in connection with the restoration and conservation of underground water supplies needed for the support of the highly profitable

horticultural communities centered about Riverside. The Department has knowledge of other areas of public lands which bear a comparable relation to communities dependent upon irrigation and to power enterprises, and it is my conviction that these lands should be withheld from private acquisition until Congress shall have had opportunity to consider the desirability of erecting from them permanent reserves like that in the San Bernardino Valley.

Ample authority exists for the proposed action in the Withdrawal Act (36 Stat., 847), by which the President is authorized to withdraw temporarily any public lands and to reserve them "for water-power sites, irrigation, classification of lands, or other public purposes to be specified in the orders of withdrawal." The action which it is proposed to take, namely, the reservation of lands at the headwaters of streams for the protection of those streams for public use, is clearly a public purpose, and is therefore authorized by the law. Rarely would the new type of withdrawal affect valuable forest lands, although frequently it might be necessary or desirable to include scattered timber. On this account and because of the provision in section 2 of the Withdrawal Act prohibiting the creation of additional forest reserves in certain States therein named it is desirable that Congress should pass specific legislation recognizing that this prohibition does not apply to the reservation of lands at the headwaters of streams for the protection of those streams for appropriate public uses, whether these uses be irrigation, navigation, or power development, or the preservation of the waters for municipal or domestic purposes.

NATIONAL IRRIGATION POLICY.

Ten years have now elapsed since the passage of the Newlands (or Reclamation) Act of June 17, 1902. That statute and the subsequent legislation which has grown out of it may be regarded as one of the largest and most immediate applications of the policy which has since become known under the name "conservation of natural resources." Its purpose was the use of national funds to reclaim arid lands and secure their subdivision into small holdings, tilled by the owners thereof residing thereon, who were to repay the cost in not exceeding 10 annual installments. The act by its terms included private as well as public lands, and the maximum holding of either which could take water from the Government works was fixed at 160 acres, while the Secretary of the Interior was given authority to require subdivision into holdings of lesser area if the same were sufficient for the support of a family.

Such a direct (though reimbursable) use of public funds for the benefit of property held or to be acquired by private parties (owners or homestead settlers) was a novelty, and the proposal met with

strong opposition in Congress. It was denounced as socialistic, and Members from the Eastern States prophesied that the settlers would repudiate their obligations to repay the construction cost and would obtain relief therefrom through political action. On the other hand, it was convincingly urged that the great and permanent development of the arid country could not safely be intrusted to private enterprise alone and was beyond the financial ability of the several Western States. The bill was passed in the belief that the pledge of public and private faith involved in it would not be violated. Its aim was the wide and permanent diffusion of wealth and of the benefits of the natural resources of fertile land and water among a large number of persons, and its success must be judged upon this basis, not by the accumulation of large fortunes in the hands of a few.

The novelty, magnitude, and inherent difficulty of the experiment demanded that the administrative officers be intrusted with large discretion and responsibility. Therefore, the Secretary of the Interior was given very large and sweeping powers by the act. It appropriates the proceeds received from time to time from public-land sales in the Western States (less 5 per cent) for the irrigation of arid lands therein, and constitutes them into a special fund called the reclamation fund. These receipts, up to June 30, 1912, have amounted to about $77,000,000, to which should be added $20,000,000 authorized by the reclamation bond act of June 25, 1910. The total amount expendable under the act has therefore been in the neighborhood of $100,000,000, and with respect to this expenditure the Secretary of the Interior was given full discretion. He was also authorized to withdraw from entry public lands needed for the construction of irrigation works, and from all but homestead entry public lands to be irrigated from such works, to make contracts for such construction, to acquire land for the same purpose by purchase and condemnation, to fix the limit of area (not exceeding 160 acres) necessary, in his judgment, for the support of a family and limit the area of entries accordingly, to estimate the cost of the works, and fix by public notice the charge per acre to be paid by settlers in reimbursement thereof. The act made the water rights acquired under it appurtenant to the land irrigated, made beneficial use of the water the basis, the measure, and the limit of the right thereto, and forbade sales of water rights to private landowners, unless resident upon or in the neighborhood of land for which the right was sold.

The first problems that pressed for solution after the passage of the act were those of engineering and construction. They have been solved with notable success. Many of the larger works, as, for example, the Shoshone, Pathfinder, and Roosevelt Dams and the Gunnison Tunnel, take rank among the great engineering achieve-

ments of our day; and, while we were not entitled to expect and have not achieved errorless results in the works as a whole, it may be said that they are well designed and carefully built to endure and serve their purpose permanently. This very merit has given rise to not a little criticism on behalf of the settlers who are to pay for the works, on the ground that the construction cost has been excessive. No general statement of this sort is justified. If a proper basis of comparison is taken it is believed that the cost of works built by the Reclamation Service is less than the cost of those of equal magnitude and efficiency constructed by private enterprise. It must be remembered that when the Reclamation Act was passed practically all of the large projects which could be constructed at low cost had been undertaken by private capital, so that one of the chief arguments for the passage of the act was that the projects remaining to be undertaken were so difficult that no other agency than the National Government could possibly undertake the work. Many private projects have brought down their apparent construction cost by building unsubstantial structures which must be wholly renewed within a few years, whereas those built by the Reclamation Service under like circumstances will last indefinitely. It follows that the ultimate construction cost of private projects so built will be very high, though it is disguised in the statistics frequently published. Moreover, the cost is generally stated as so much per acre of the land irrigated, and the Government estimates have been based upon a careful attempt to secure an adequate supply of water for every acre in the project for nearly every year, whereas many private projects have attempted to cover a much larger acreage with works of the same capacity and thus take chances upon the probability of obtaining water. This reduces the estimated cost per acre of such private projects, but subjects the farmer to a risk which should not be put upon him and which ultimately will have to be removed by additional construction cost for storage or other new water supply.

The problems confronting the Service are rapidly becoming those of administration rather than engineering. They concern the use of the works which have been constructed, the distribution of water through them to the settlers, and the realization by the settlers and the public of the benefits intended by the act. They are human problems and their solution requires the doing of justice in dealing with many thousand farmers and the maintaining of a spirit of cordial cooperation with them. For this reason, as indicated in my last annual report, the project engineers in charge of the building works are being replaced as rapidly as circumstances warrant by irrigation managers selected not only for their knowledge of the physical methods of operating a project, but largely for their business and

executive qualifications. Undoubtedly some ground for past criticism exists in particular cases, but it must be remembered that among the many thousands of irrigators on the Government projects there must inevitably be a considerable percentage of the unskilled and unfortunate who suffer disappointment, which results in complaints against the officials in charge of the project. Many of the farmers on the 14,000 farms or more to which water is being delivered are thoroughly qualified for this form of agriculture, but many others have never before practiced irrigation. Some have come from the cities and are wholly ignorant of country life in general and of arid conditions in particular. Pioneering on a reclamation project is still pioneering, requiring courage, energy, and resolution to overcome its hardships. The unsuccessful men are unable to pay their installments of water charges. This renders their entries or water-right purchases subject to cancellation, a harsh remedy which is not applied if there is good cause to believe that leniency would result in ultimate success. Such cases are carefully investigated before cancellation is ordered. In most cases of failure it is found that little, if any, permanent improvements have been made and that the lands were originally taken up for speculative purposes. In such cases prompt cancellation is effected in order to permit some other settler to enter upon and utilize the land. The greatest present need of the projects is that of bringing to the reclaimed land the class of settlers who are competent to make use of its opportunities, and of encouraging or stimulating them to produce larger average crop values such as to justify the labor and cost of irrigation. It is commonly supposed that the difficulty of reclamation work is solved when water is had and the works are completed; on the contrary, this is only the beginning. Financial or technical questions of building shrink into insignificance compared with the more difficult human problem of dealing with thousands of settlers and of inducing them to take action along lines which will lead to their greatest individual success.

Until the passage of the act of June 25, 1910, the Department was without authority to keep new settlers away from reclamation projects during the time of construction. Consequently, as soon as a reclamation withdrawal was made, settlers flocked in, took up all the lands, and waited for the construction of the works which were to furnish them water, a process which occupied many years and led to very great complaint on the part of the settlers. Among them were many so-called "professional pioneers," namely, the more restless members of the community who are always looking for something better beyond the horizon. They frequently took up the lands in the hope of selling out at an advanced figure after water should have been supplied. In other words, their purpose was speculative, and the speculation, if successful, would saddle the newcomer pur-

chasing from them with the burden of the profit the speculator had made out of the transaction. Settlers of this kind neglected to till the soil themselves after water was available, or did as little as possible without endangering their entries, hoping from year to year to dispose of their interest in their farms. In the meantime thousands of acres of land for which a large public investment has been made to furnish water are being held out of use because the owner is not ready or able to utilize the ground. The result is a low average of crop production and the presence of considerable tracts of uncultivated or poorly cultivated fields. This discourages newcomers and adds to the labor of the men on the ground because a single acre of weeds will furnish seeds enough to injure an entire section of tilled lands. What is needed is not the relaxation of rules which prevent speculation, but the discriminating encouragement of the man who has actually cultivated his entire holding to the best advantage. No encouragement should be given to the speculator or inefficient farmer who is trying to hold a piece of Government land out of cultivation in order to gain the unearned value thereof which arises from the toil of others and the expenditure of public money.

From this point of view the objections frequently made to the fixing of a less area than 160 acres as the limit of a single holding, called a "farm unit," which can be patented under the homestead law within a reclamation project, or the acquiring of a water right therefor, are peculiarly without merit. Many of the settlers who went upon the withdrawn lands before the construction of the works and made entry for 160 acres protest vigorously against being required to conform their entries to farm units of 80 or 40 acres. These units are fixed in each project at such number of acres as "may reasonably be required for the support of a family," as the statute prescribes. The 160-acre limit prescribed by the general homestead law was based upon the supposition that that area was sufficient for the support of a family on the new lands which could be settled and farmed without irrigation. The public interest demands that the land should be worked by the owners thereof and should support in comfort as many families as possible. The entryman should unquestionably be given the benefit of the doubt. Some farm units may have been made too small; the standard of "reasonable requirements for the support of a family" may have been too low in some instances; but the investigations, the observations, and the actual experience of the Reclamation Service seem to show that these things have not thus far occurred. To give one entryman 160 acres of public land where 80 is sufficient to support his family makes him a speculator with reference to the excess and enables him to levy tribute upon the settler who ultimately buys it. The same is true with respect to water rights for private lands in excess of the farm unit area.

The act of August 9, 1912 (37 Stat., 265), already referred to, extends the prohibition as to excess holdings beyond the time when patent is issued and until the "final payment in full of all installments of the building and betterment charges," and provides for forfeiture of such excess. The said act further discourages speculation by expressly placing upon the purchasers of water rights for private lands the same duty of cultivation and reclamation (one-half the irrigable area before certificate of water-right issues) that was imposed by the original act upon the entrymen of public lands. Those who desire to hold lands within reclamation projects for speculative sales or for present leases to tenants object to the provisions of the reclamation law which require them to reside on or in the neighborhood of the land for which water right is purchased. In my judgment, such ownership should not be encouraged and the rule of residence as now construed should not be relaxed. Nevertheless, as I pointed out in my report of last year, there are good reasons for allowing an irrigator, whether on public or on private lands, to postpone the beginning of his residence until he has had opportunity to put in crops and, if possible, to obtain from the land the means of supporting himself and his family. For this reason the Department's draft of a bill to amend the reclamation law proposed to remove homestead entries under the reclamation act from the operation of the general homestead law in this respect, to call them by the distinctive name of "reclamation entries," and to allow such a postponement of the establishment of residence until two years after the entry is made. I am still of the opinion that such is the true solution of the difficulties presented.

The requirements for repayment of the cost of the works by the settlers in not exceeding 10 annual installments have given rise to many complaints. The schedules of repayment first established made these installments equal, but, as stated in my last report, they have been generally graduated so that they are small during the early years, when the irrigator is subduing his land and making it fit for efficient crop production, and large in the latter part of the 10 years, when it may be supposed that the production will be sufficient to carry the burden. Some of the objectors have not been satisfied with this concession, but have demanded an amendment of the law which will extend the period of repayment from 15 to 20 years instead of 10. Much of the agitation for this change has taken place in those projects where the construction cost has not yet been determined and therefore where no annual installments have yet been announced, the water being distributed to such lands as can now be served under an annual rental contract at a price approximately equal to the expense of delivery without regard to the construction cost. It should be noted that under such circumstances the water user may bring his farm into the fullest productive condition before being required to

pay any part of the construction cost whatever, and therefore, that there is less basis there than elsewhere for the proposed lengthening of the reimbursement period.

The chief beneficiaries of such a lengthening would be those men who own extensive tracts of private land within the reclamation project and have been required to sell them in order to secure water rights for them under the restrictions of single holdings above referred to. Such sales are made on time and partial payments thereon are often required annually. The purchaser buys the land from the owner and subsequently buys the water right from the Government. Before the initiation of the project such land was of little or no value, but the prices at which it is now sold without water are frequently very high and give very large speculative profits to the former owners. A purchaser who is under contract to pay annual installments upon the purchase price of $200 per acre for his land objects to the burden of the installments annually due on the Government water charge, though all such installments taken together may amount to only $50. In other words, the demand is that the huge speculative profit shall be first paid and that the reimbursement of the Government for the actual cost of the works should be postponed. This demand is fundamentally vicious and unjust. It not only diverts to private speculators the benefits of a great enterprise undertaken for the public benefit, but it inevitably postpones the day when the settlers are to take over the management of the works as is contemplated by the Reclamation Act, and it prevents the replenishment of the reclamation fund for the development of other projects. The public interest demands that the settlers should, as soon as consistent with the return of the Government investment, assume responsibility for their own welfare and relieve the Federal Government from guardianship over them; also that the investment be returned at the earliest practicable moment and the benefits of the act be thus extended throughout the West with the utmost rapidity practicable. The postponement of payment therefor means local favoritism and large and frequent private profits at the expense of the general public.

In this connection I desire to emphasize the interest of every citizen of the United States, and particularly of every farmer, in the East as well as in the West, in promoting a faithful fulfillment by the settlers on reclamation projects of their obligations to repay to the Government the cost of the works and the cost of operating and maintaining them until they are turned over to such settlers. Various schemes of Government aid in agricultural development are proposed and have been adopted in other countries. Many of these proposals, if based on a conservative estimate of the resulting increase in productivity, are fundamentally sound in proportion as the obligation of repayment is sacredly fulfilled. Therefore every pro-

posal for the repudiation of any part of the cost of reclamation works, or of the cost of their maintenance and operation, or for the unnecessary postponement of the payment thereof, is a blow struck at agricultural development in every part of the United States. Let it once be known that the first great experiment in the direct use of Government revenues to aid individual farmers to increased crop production has resulted in the repudiation of their obligations to repay, or even in a formidable attempt to avoid or unnecessarily to postpone payment, then all hope of the continuation of such a beneficent policy, to say nothing of its extension to regions which have not yet felt its benefit, will be at an end.

LOWER COLORADO RIVER.

With my previous annual report I transmitted to you, and you thereafter submitted to Congress, documents giving the details of the work then done along the lower Colorado River in Mexico, under the appropriation of $1,000,000 made by Congress on June 25, 1910, for the purpose of protecting the lives and property interests of the citizens in the Imperial Valley, California. These documents also included the report of a board convened by your direction to make a careful study of the work accomplished and to suggest plans for future operations. This board recommended an immediate appropriation to meet emergencies, but such appropriation has not been made. The work has, therefore, been necessarily confined to such operations as were practicable with an unexpended balance of about $200,000 available during the past year from the appropriation of June 25, 1910. It was decided to restore the levee north of the Abejas River and raise the Volcano Lake levee so as to prevent the flow of the Colorado River at flood stages from reaching Imperial Valley by way of New River. A patrol was kept on the levee north of the Abejas River until the floods of 1911 had subsided. About 14 per cent of the yardage of the levee was lost by the flood of 1911. No further damage was done during the flood of 1912. In December, 1911, the levee north of the Abejas River was repaired and brush tappoons along the river base were constructed. The railway which had been built to carry material to the site of the dam for the closure of the Abejas break was taken up and the steel returned to the Southern Pacific Company, by which it had been furnished.

The enlargement of Volcano Lake levee was begun on January 14, 1912. The work consisted of raising the levee 4 feet with earth and adding a paving of rock on the water side thereof to protect the earthen slope from erosion. The levee has a crown of 12 feet and side slopes of 1 on 2. It has a length of about 8 miles and the work was completed June 2, 1912. The contractor's equipment was removed and the work finally accepted September 15, 1912. The total amount

expended on the work up to October 31, 1912, was $938,872.74, leaving a balance of $61,127.26 with which to pay outstanding liabilities.

In addition to the work described, further physical investigations and surveys of the delta were made, the results of which will be of service in connection with such further operations as may be provided for. All of the material and equipment borrowed from the Southern Pacific Company has been returned, and all government property purchased for the work and not used has been disposed of and the funds realized from sales have been accounted for in the usual manner.

The most important feature of the report of the advisory board above referred to was the recommendation that by agreement with the Government of Mexico an international Colorado River Commission should be created, to be composed of Mexican and American engineers with authority to investigate and report to their respective governments a basis for the final adjustment of all questions affecting the use and control of the waters of the Colorado River in which the two countries have a mutual or related interest. Negotiations for this purpose are now actively in progress with the Government of Mexico, and the Department of State reports that there is every reason to believe that an understanding will be reached and an agreement signed in the near future. It is of great importance that this should be done.

In further reference to this subject attention is respectfully invited to the message of the President, dated February 2, 1912, transmitting data of this Department, published as House Document No. 504, Sixty-second Congress, second session, and the message of the President, dated June 14, 1912, transmitting a letter from this Department recommending further appropriations for the work, and published as Senate Document No. 846, Sixty-second Congress, second session.

RECOMMENDATIONS CONCERNING INDIAN ADMINISTRATION AND OTHER MATTERS.

Under the heading "Office of Indian Affairs" I have presented at some length my views of the present administrative conditions in that important branch of the public service and have made certain recommendations for their improvement. In reporting upon the work of other bureaus of the Department specific recommendations are made upon various matters directly affecting these bureaus, respectively.

The needs of the Patent Office for larger quarters and a new building are presented in connection with its report, but the important records of the other bureaus of this Department should be provided with a properly constructed, fire-proof, central filing place at the earliest practicable date. A Hall of Records for the entire depart-

mental service in the District of Columbia is an alternative suggestion worthy of careful consideration. So long as this need is not met in some appropriate way there is constant and real danger of irreparable loss from fire and other causes of destruction.

The events of the last year have confirmed and emphasized the urgent need for a Bureau of National Parks. Bills for this purpose have been introduced in the present Congress and have been given some attention in committee.

I renew the recommendation made in my last report for the enactment of legislation providing for the retirement and pensioning of civil employees of the Government.

OFFICE OF THE ASSISTANT ATTORNEY GENERAL.

The following table shows the number of matters received and disposed of by the office during the year ending October 1, 1912, but only to the extent of matters formally docketed. It does not include a multitude of matters that are not formally docketed:

Work of office of Assistant Attorney General.

	Public lands.		Pensions.		Indian.	General opinions.	Disbarment.	Miscellaneous.	Total.
	Appeals.	On rehearing.	Appeals.	On rehearing.					
Pending Oct. 1, 1911	1,280	101	448	5	38	18	3	173	2,066
Received to Oct. 1, 1912	3,314	476	2,201	43	17,569	265	15	10,900	34,783
Total	4,594	577	2,649	48	17,607	283	18	11,073	36,849
Disposed of Oct. 1, 1911, to Oct. 1, 1912	2,437	504	1,847	44	17,603	273	11	10,822	33,541
Balance	2,157	73	802	4	4	10	7	251	3,308

In illustration of the comment that these figures, large as they are, do not fully show the number of matters requiring the attention of this office, a record of that section of the office dealing with Indian matters is significant. The record referred to was kept during the months of January to June, 1912, to include undocketed as well as the formally docketed matters submitted for action. While the latter during that period amounted to 8,839, the actual number of matters considered and disposed of was 20,067.

The growth of work in this office is shown in a note accompanying the estimates for the Department and supporting the recommendation for an increase in the force. Docketed cases and matters received for action were, in the year ending October 1, 1909, 4,755; 1910, 13,301; 1911, 16,609; and 1912, 34,783.

The arrears, October 1, 1911, were 2,066; October 1, 1912, 3,308. The continued growth in the number of arrears is already embarrassing; and with the present insufficient number of attorneys and with

the maintenance of the ratio of increase in the demands upon the office, the arrears must very soon become overwhelming. Moreover, of the arrears two-thirds involve contested land matters. This is highly prejudicial to the interests of entrymen under the public-land laws. It must be apparent to anyone, and experience has taught that it is true, that it is impossible to increase the proper disposition of public-land appeals without increasing the force.

It is proposed elsewhere to relieve this office of the work in pension-appeals matters. But this will in no manner mitigate the evil of accumulating arrears in public-land matters. There is but one relief for that, and that requires an increase in the working force.

Aside from the adjudicating duties of the office and the various other items shown in the above table, the litigation in the local courts is now of such a volume as to require, during term time, from October to July, a large amount of the time of one of the assistant attorneys as well as demanding a great amount of the time of the Assistant Attorney General himself in preparing for and trying the cases in court. During the year there has been final judgment in the Court of Appeals in 7 cases, in the Supreme Court of the District of Columbia in 11 cases, in all of which the Department was successful. There is 1 case in the Court of Appeals, argued and submitted, but not yet decided, and 2 cases in the same status in the lower court. These figures do not, however, include interlocutory matters. There are still pending in the Court of Appeals 2 cases, in the Supreme Court 22 cases.

In addition to this, attention is called to the fact that in response to requests of committees of Congress for reports on the great mass of bills affecting this Department such reports must be largely prepared in the office of the Assistant Attorney General.

In my annual report for the fiscal year ended June 30, 1911, I called attention to the necessity for increased appropriations for the office of the Assistant Attorney General "to provide for a greater number of specially qualified assistants," and stated that if the force were strengthened as suggested by me "the conflicting interests of the claimants and of the Government would be more carefully and correctly decided than is now possible, and that the business" of that office "will be expedited, and that those who have contested claims before the Department for adjudication will be better satisfied."

Notwithstanding this recommendation, and the further fact that in the estimates for the Department for the past fiscal year a small increase was asked for along the lines suggested by me in my report, Congress not only did nothing with the recommendation, but, indeed, refused to allow the increase asked for in the estimate. Had the recommendation received sufficient consideration and been acted upon, a proper reorganization of the force in the office of the Assistant

Attorney General could have been had, and the arrears in the disposition of the public-land appeals would be in the process of constant reduction while the cases would receive more extended consideration than now is possible.

The reasons for the recommendation in my last report are even more urgent now than they were then.

GENERAL LAND OFFICE.

The work in the General Land Office during the past year has been brought up to date with a few minor exceptions. In homestead cases patents are being written within four months from date of proof. This length of time intervening between the date of proof and the issuance of the patent is not objectionable as it allows time within which to guard against hasty action.

The year 1912 saw the completion of 100 years of existence of the General Land Office as a separate bureau. At the time of its creation, May 7, 1812, the organization of the Land Office consisted of 10 persons, including the commissioner. There were 19 district land offices and 1 office of surveyor general. At the close of the fiscal year 1912 the employees in the field and in the city of Washington numbered 1,417, with 102 district land offices, 13 offices of surveyors general, and 12 field divisions. The centennial was celebrated by the employees of the office with appropriate exercises.

The work of the field force during the past year has evidenced the high efficiency of that force. Although the appropriation was reduced by $100,000, which necessitated the reduction of the field force, there were more entries examined and reported upon during the year 1912 than during either of the two prior years when a larger number of agents were employed and a larger appropriation was available. Examinations in the field are made of Carey Act projects, State selections, railroad selections, townsite cases, timber and stone entries, isolated tracts, forest lieu selections, Indian allotments, water companies in cases of desert-land entries, in addition to cases wherein allegations of fraud are made.

Considerable progress has been made by the field force in the disposition of coal-land investigations in Alaska. There have been submitted reports on 454 claims during the year, and out of 1,129 coal locations before the General Land Office there are only 199 which have not been investigated; of the latter number, 144 have been either canceled or held for cancellation for failure to submit applications for patent within the time required by law, leaving only 55 pending claims which still require some investigation. It is expected that during the present field season these remaining claims will be investigated. During the year adverse proceedings were directed against 188 claims, which brings the total up to 300 on which

hearings have been ordered; of this number, 219 are at issue, and every effort will be made during the coming year to dispose of these cases.

Another important work in the field is the California oil land investigations. There are included in withdrawals in California over 1,500,000 acres containing valuable petroleum deposits. Of the lands withdrawn approximately 100,000 acres are covered by pending entries and selections. Much of the remainder is covered by mineral locations of oil, gypsum, and asphaltum. A number of special agents and mineral inspectors of the field service are devoting almost their entire time to the work of investigating these entries and selections and in assisting the officials of the Department of Justice in suits which have been or are to be instituted for the recovery of title to a large part of these lands to which patents have issued under applications for the lands which alleged that they were nonmineral in character.

The total cash receipts from the sale of public lands, including fees and commissions on both original and final entries, for the fiscal year 1912 were $6,671,718.54. Miscellaneous receipts were as follows: From sales of Indian lands, $2,284,538.37; reclamation water-right charges, $914,542.31; sales of timber in Alaska, depredations on public lands, sales of Government property, and copies of records and plats, $102,248.78, making the aggregate total of cash receipts of the General Land Office during the fiscal year 1912, $9,973,048, a decrease of $1,116,879.60 from the preceding year.

The total expenses of district land offices for salaries and commissions of registers and receivers, incidental expenses, and expenses of depositing public moneys during the fiscal year ended June 30, 1912, were $850,121.04, a decrease of $20,120.96. The aggregate expenditures and estimated liabilities of the public-land service, including expenses of district land offices and surveys, were $3,573,692.88, leaving a net balance of $6,399,355.12, including Indian moneys.

The total area of public and Indian land originally entered during the fiscal year ended June 30, 1912, was 14,574,688.82 acres, a decrease of 3,064,410.72 acres as compared with the area entered during the year 1911.

The area patented during the fiscal year was 10,135,475 acres, a decrease of 2,137,020 acres as compared with the fiscal year 1911. Of this area 5,011,948 acres were patented under the homestead law.

During the past year there were approximately 182,800 acres of agricultural lands in national forests opened to settlement and entry under the act of June 11, 1906 (34 Stat., 233).

PUBLIC SURVEYS.

The success of the direct system of surveys after the second year's work is manifest. The expenses attending the execution of surveys

under this system have been greatly diminished by the adoption of business methods in the management of the field force and in the matter of supplies; the expenses of equipment of surveying parties in the field are lessened because of a sufficient number of instruments and government-owned animals and wagons now on hand, which were purchased from previous appropriations. On June 30, 1912, there were 87 parties in the field, and in October the number was increased to 106.

TEXAS-NEW MEXICO BOUNDARY.

The returns of the survey for the reestablishment of the boundary line between Texas and New Mexico, authorized by the resolution approved February 16, 1911, have been examined in the General Land Office, and the record, duly attested and certified to by the commissioners on the part of the Government and Texas, has been submitted for your approval. A request has been made, however, that some controverted questions be further considered before you approve the survey.

CAREY ACT.

The number and acreage of applications for segregation filed under the Carey Act during the past year show a marked decrease from the preceding year, due principally, it is thought, to the fact that the easiest and cheapest projects were naturally taken up first and that the field of operation is becoming more restricted. As a result of the practice of thoroughly investigating applications under this act, fewer merely speculative projects will be presented to the States or will be submitted by the States to the Department. During the year 1912 applications for but 184,697.39 acres were filed. Applications aggregating 97,917 acres were approved. In applications under the act of March 15, 1910 (36 Stat., 237), 1,416,474.04 acres were applied for, applications involving 593,189.28 acres were rejected, 214,211.62 acres were withdrawn, and 1,064,572.89 acres were restored upon the expiration of the year granted by the act or upon relinquishment.

STATE AND TERRITORIAL GRANTS.

During the past fiscal year there were approved to the States and Territories an area of 181,280.62 acres, of which 147,988.16 acres were school-land selections.

RAILROAD GRANTS.

During the fiscal year 1912 there were patented on account of railroad and wagon-road grants an area of 25,393.87 acres. This is considerably less than the area patented in 1911, on account of the suspension of the issuance of patents pending decision as to whether the patent should contain a mineral-exclusion clause.

CHIPPEWA LOGGING, MINNESOTA.

During the past fiscal year there were logged under contracts on ceded Chippewa lands 102,245,370 feet of timber, of the value of $878,717.39, as compared with 80,005,150 feet, valued at $572,830.73, during 1911.

SALES OF CHIPPEWA PINE TIMBER.

On October 21, 1911, a sale of pine timber on ceded Chippewa lands, Minnesota, was held at Cass Lake, Minnesota. This timber was offered at previous sales, but not sold for want of bidders. Bids were accepted for 4,815,000 feet of white pine and 2,016,000 feet of Norway pine, the total price being $34,524.74, an average of $5.06 per thousand feet. The price paid for timber on ceded Chippewa lands sold at the different sales is $6,811,968.70.

LEGISLATION.

Since the last annual report of the Commissioner of the General Land Office the most important legislation enacted affecting the public-land service was the act approved June 6, 1912 (37 Stat., 123), commonly called the "three-year homestead bill." At this time it is too early to predict results of this legislation, but it will undoubtedly increase the work in the General Land Office during the coming year in the examination of proofs which will be submitted under the new law. The Department has recently determined that this legislation is operative in the Territory of Alaska.

An act of Congress was approved April 30, 1912 (37 Stat., 105), whereby the privileges of the act of June 22, 1910 (36 Stat., 583), are extended to the several States, thus permitting the States to select in satisfaction of grants for educational or other purposes lands withdrawn or classified as coal lands (subject to the coal reservation).

COMMISSIONER'S RECOMMENDATIONS.

In his annual report for the year 1912 the Commissioner of the General Land Office again calls attention to the inadequacy of the salaries paid to the higher employees of the Land Office, and renews his recommendation for a readjustment, so that a substantial increase may be made in the salaries of those who perform the higher grades of work in that office.

I concur in the recommendations again made by the Commissioner for legislation along the following lines:

(*a*) The reorganization of the Land Office by the enactment of legislation providing for the creation of a board of law review consisting of five members, to have authority to decide, as a judicial body, matters before the General Land Office, with a right of review in

the commissioner and appeal to the Secretary. Legislation of this kind would result in relieving the commissioner of a great deal of the detail in passing upon and signing decisions and letters of an important character. It would give him more time to devote to the important executive duties which devolve upon him.

(*b*) The abolishment of the office of receiver in the local land offices and the substitution of a bonded civil-service employee at a smaller salary than now allowed to the receiver; this would result in a saving to the Government of a considerable sum each year.

(*c*) The enactment of legislation providing for the taking of final proofs in homestead and desert-land entries on the land involved. This would obviate a long trip from the land to the local office and put the homesteader to no greater expense than he is put to under the present conditions. It would also save considerable time now consumed in investigations made subsequent to the offering of proof.

(*d*) The amendment of the compulsory attendance act of January 31, 1903 (32 Stat., 790), so that in contest cases the attendance of witnesses living within 100 miles of the place of hearing may be secured. At present, if a witness resides outside of the county in which hearing is held, his testimony must be taken by deposition. Considerable confusion relative to the adjustment of fees of witnesses arises under the present law, which will be obviated by the suggested amendment.

(*e*) Legislation providing for the regulation of professional locators and of advertisements in relation to the disposition of public lands. The General Land Office is still in receipt of frequent complaints of hardships suffered by persons who have sought to enter public lands by reason of deception on the part of persons to whom payments were made to secure for them locations. Legislation of this character is desired for the protection of the honest home seeker against the methods employed by unscrupulous locators.

GEOLOGICAL SURVEY.

The scientific investigations of the survey have been continued along lines similar to those followed in other years, and the usual number of contributions have been made to the knowledge of geology and related subjects. The appropriations for the work of the United States Geological Survey for the fiscal year 1912 aggregated $1,507,920. While the appropriations made directly for survey work show an increase of only $30,480 over those of 1911, there was a notable increase in the amount of work done by the field service. The funds available through cooperation with other Federal bureaus and with the States amounted in 1912 to 27 per cent of the direct appropriations and showed an increase of 42 per cent over coopera-

tive funds of the preceding year. This increase in the field work involved a large increase in the work of the Washington office, to which was added the greatly increased service rendered the Secretary's office, the General Land Office, and the Office of Indian Affairs in connection with public-land administration. Although the practical economic work of the survey has greatly increased during the year, the investigations which have been steadily carried forward have yielded some noteworthy scientific results, and important contributions, based on long-term studies, have been made to the knowledge of geology and related sciences.

NEED OF SURVEY BUILDING.

The present rented quarters of the Geological Survey are wholly inadequate and unadapted to its needs. Scientific data, including unpublished maps and detailed stream gauging records and other material produced at an estimated cost of nearly $5,000,000, but of a much greater possible value to the Government, and in part irreplaceable, are in constant danger of destruction by fire, while the noisy location, poor light, dirty conditions, and congestion in the building are limitations on economy and efficiency which seriously hamper all efforts for better administration. The crowded and insanitary condition which prevails can be described without exaggeration as in large part comparable to a sweatshop. The large amount and the high class of scientific production that is expected and required of the Geological Survey, as well as the danger to invaluable public records, demand a remedying of these conditions which shall bring the survey quarters more nearly in accord with modern office requirements.

CLASSIFICATION OF THE PUBLIC LANDS.

In this work, wholly economic in character, the highest results are possible only where there is full knowledge of the scientific data pertaining to the public domain and its resources. The land classification board of the survey draws heavily and constantly not only upon the results of current scientific investigation, but upon the conclusions of the geologists and engineers who have contributed to the survey's published and unpublished data during the past 30 years. On May 1, 1912, the land classification board was formally recognized as having the rank of an independent branch within the Geological Survey. The increasing amount and the more exacting character of the work of land classification are indications of the awakened interest in a businesslike administration of the public domain. To encourage development and at the same time to enforce wise utilization by preventing partial or wasteful use is to protect the public interest. With the different values of the land made known by adequate examination,

the highest use can be determined and provided for in so far as the statutes are in accord with economic law. Under the Withdrawal Act of June 25, 1910, the Geological Survey recommended during the year more than one and one-fifth million acres of oil reserves and almost one and one-third million acres of phosphate reserves, based on geologic data, and more than one-third million acres of water-power sites and 60,000 acres of irrigation-reservoir sites, based upon hydrographic and topographic surveys, and 86,000 acres of public water reserves essential to the control of the public grazing lands. As regards the classification of coal lands, the year has been notable in that for the first time the acreage classified and restored has much exceeded that withdrawn for classification, so that at the end of the year there was a substantial reduction in the area of outstanding land withdrawals. More than 800,000 acres were classified as coal land and valued at nearly $15,000,000, while nearly 14,000,000 acres were classified as noncoal lands. (Tables will be found in the appendix.)

GEOLOGIC BRANCH.

Geologic surveys and investigations were continued in 40 States by a force of 109 geologists. Fifty-nine per cent of the appropriation was expended in the public-land States. Systematic detailed surveys of mining districts were continued in Colorado, Arizona, Utah, Idaho, Montana, Oregon, and Nevada, and general and detailed geologic and paleontologic investigations were conducted in all parts of the country. A large amount of geologic work was done in the coal fields of the public-land States.

In Alaska 13 field parties covered 14,460 square miles by reconnaissance topographic surveys, and 246 miles by detailed topographic surveys. Reconnaissance geologic surveys were made of 10,550 square miles and detailed geologic surveys of 496 square miles. In addition 8,000 square miles were covered by exploratory geologic surveys, and investigations of the water supply in placer districts covered approximately 8,000 square miles, including 68 steam-gauging stations and 309 measurements of stream volume. Twelve of the 30 mining districts of Alaska which are being developed were visited.

The work of the Mineral Resources Division consisted in the preparation of the reports on the mineral resources of the United States for the calendar years 1910 and 1911. The volumes, prepared under the direction of geologists who have specialized in the subjects treated by them, have under this treatment come to be a cyclopedia of information concerning the mineral resources of the United States. Knowledge of the storehouses from which the Nation's future supplies are to be drawn is considered to be of prime importance, of greater value, indeed, than the record of past mining achievements

which is presented in the statistical compilations of the report. Recent volumes have included general maps showing the areas in the United States producing the precious and semiprecious metals, coal, iron, ore, petroleum, natural gas, cement materials, gypsum, salt, and various other minerals. A special effort has been made during the year to secure prompt returns from the mineral producers, and thus an earlier publication of the separate advance chapters of the report, which has met with gratifying results.

TOPOGRAPHIC BRANCH.

The new area topographically mapped was 28,136 square miles, making the total area surveyed to date in the United States 1,160,396 square miles, or 38 per cent of the entire country. In addition 5,274 square miles were resurveyed, making the total area of surveys during the year 33,410 square miles. Topographic surveys were also prosecuted in Hawaii to the extent of 281 square miles. The topographic field force numbered 161. In addition 60 technical field assistants were employed during the whole or part of the field season.

WATER RESOURCES BRANCH.

With the same appropriation ($150,000) as that of 1911, the scope of the work has been considerably increased, due to the larger amount of cooperative money furnished by certain States, and in the case of New Hampshire by the necessity for intensive hydrometric investigations in the White Mountains under the authority of the Weeks Act. River gauging stations were at the close of the year being maintained at 1,232 points, exclusive of those in Alaska and Hawaii. In addition, records were received from 186 stations maintained by private enterprise. A large amount of work was carried on in the public-land States relating to the classification of the public lands, besides investigations of underground and surface water conditions throughout the country. Sixty-nine per cent of the appropriation was spent in the public-land States.

EXAMINATIONS UNDER WEEKS ACT.

Work under this law (act of Mar. 1, 1911) was vigorously prosecuted by the survey in North Carolina, Virginia, West Virginia, Tennessee, South Carolina, Georgia, and New Hampshire, resulting in the submission during the year of 10 favorable reports, covering 1,869,845 acres.

PUBLICATIONS BRANCH.

The number of books distributed during the year was 437,637 and the number of maps and geologic folios 688,983, a total of 1,126,620. Of these, 529,656 maps were sold. The amount of money received

and turned into the Treasury from the sale of publications was $25,755.22, an increase of $4,171.67 as compared with the figures for 1911.

ADMINISTRATIVE BRANCH.

The official mail other than requests for publications shows an increase of approximately 6 per cent over that of the preceding year. The roll of survey members holding secretarial appointments numbered at the close of the year 880 persons, an increase of 18. The library received during the year 12,886 books and 1,124 maps.

RECLAMATION SERVICE.

The act of Congress approved June 17, 1902, known as the "Reclamation Act," creates a fund for the reclamation of arid lands from the moneys received from the sale of public lands in certain of the Western States and Territories, excepting the 5 per cent of the proceeds of such sales set aside by law for educational and other purposes. The actual receipts from this source to June 30, 1911, were $71,720,349.08, and the estimated total receipts to June 30, 1912, including $229,222.67 from sale of townsite lots, are $77,612,201.41. The net investment of this fund in reclamation works on June 30, 1912, amounted to $69,858,216.93.

The act requires the Secretary of the Interior to determine, with a view to its return to the reclamation fund, the estimated cost of construction, and entrymen and private landowners receiving water from reclamation projects are therefore required to contribute their proportion of the cost of construction, operation, and maintenance of the project wherein their lands are situated. The cash receipts from this source to June 30, 1912, were: Building repayments, $2,156,442.75, and operation and maintenance, $877,825.82.

In addition, sales of water to towns and cities, leases of power developed on the projects, rentals or carrying charges for irrigation water, miscellaneous sales of old material, etc., have produced an additional return of $3,189,275.56. Reimbursement for work done for the Indian Service amounts to $1,581,236.62. Under the respective laws authorizing these transactions this amount is credited as a reduction of the cost of the projects.

No new projects have been undertaken since 1906, but prior to that date 25 primary projects had been undertaken, the net investment in which on June 30, 1912, amounted to $68,823,171.56, as shown in the following table.

Net investment in reclamation projects to June 30, 1912.

State.	Project.	Net investment.
Arizona	Salt River	$9,641,595.53
Arizona-California	Yuma	5,765,285.71
California	Orland	554,871.74
Colorado	Grand Valley	101,415.11
Do	Uncompahgre	4,780,191.11
Idaho	Boise	6,958,350.90
Do	Minidoka	4,101,817.31
Kansas	Garden City	380,527.20
Montana	Huntley	886,958.50
Do	Milk River	1,004,309.63
Do	Sun River	863,581.50
Montana-North Dakota	Lower Yellowstone	3,041,709.27
Nebraska-Wyoming	North Platte	5,438,721.92
Nevada	Truckee-Carson	4,571,653.62
New Mexico	Carlsbad	692,154.57
Do	Hondo	353,962.44
New Mexico-Texas	Rio Grande	880,797.49
North Dakota	Pumping	873,896.11
Oregon	Umatilla	1,293,667.04
Oregon-California	Klamath	1,990,902.24
South Dakota	Bellefourche	3,083,149.11
Utah	Strawberry Valley	1,826,481.07
Washington	Okanogan	556,642.31
Do	Yakima	5,488,921.52
Wyoming	Shoshone	3,691,608.61
Total primary projects		68,823,171.56
Secondary projects		586,992.94
Arizona-California, Colorado River		43,709.23
Oklahoma, Cimarron		9,128.92
Oregon, Central Oregon		40,391.67
Townsite development		15,677.85
General		32,902.54
Indian:		
Blackfeet, Montana	$143,503.64	
Flathead, Montana	152,625.36	
Fort Peck, Montana	10,113.22	
		306,242.22
Total		69,858,216.93

Included in the above are the expenditures on investigation of various so-called secondary projects or enterprises which have not been found to be such as to warrant immediate undertaking. There are also in addition certain investments in townsite development, $15,677.85; in Indian irrigation, reimbursable, $306,242.22; and for general expenses, not distributed on June 30, 1912, $32,902.54; making a total of $354,822.61.

Every effort has been directed toward the completion of those projects or portions of projects where the most immediate results can be had in the way of irrigable area. There are numerous requests for the survey of secondary projects which must be denied primarily because of lack of money to undertake them even if they should be found worthy.

The following table contains a summary of the results of the work from the time of the passage of the act of June 17, 1902, to June 30, 1912:

Summary of results to June 30, 1912.

Estimated area of all projects when completed	acres	3,020,689
Area for which the service is prepared to supply water	do	1,168,530
Area receiving water under permanent water right contracts	do	452,132
Area receiving water under temporary rental contracts, etc	do	383,572
Total area under contract for irrigation, 1912	do	835,704
Reservoir capacity	acre-feet	4,833,070

Canals built:		
Capacity over 800 second-feet	miles	310
Capacity 301 to 800 second-feet	do	454
Capacity 50 to 300 second-feet	do	1,083
Canals and drainage ditches built, capacity less than 50 second-feet	miles	5,507
		7,354
Number of tunnels built, 72; length, 113,534 feet	do	21.5

Storage dams built, volume 7,795,346 cubic yards.
Diversion dams built, volume 912,961 cubic yards.
Dikes built, volume 3,553,000 cubic yards, 80 miles.

Canal structures built costing—	
Over $2,000	568
$500 to $2,000	1,142
Less than $500	33,398
Total	35,108

Bridges built: Number, 2,908; length, 61,300 feet.
Buildings erected: Offices, 70; residences, 379; others, 346; total, 786.
Roads: Miles constructed, 659; railroads built, 44 miles.
Telephone lines: Miles constructed, 2,118; phones in use, 838.
Transmission lines: Constructed, 311 miles.
Material excavated: Class I, 79,790,814 cubic yards; Class II, 6,037,065; Class III, 4,846,402; total, 90,674,381.
Riprap: 377,407 cubic yards; paving, 439,940 square yards.
Cement used: 1,389,555 barrels; concrete in place, 1,157,507 cubic yards.
Cement manufactured by United States: 338,452 barrels.
Pipe laid: Concrete, 395,553 feet, tile, 35,733 feet; steel and iron, 28,483; wood, 171,017; total, 630,786=120 miles.
Flumes built: Concrete, 2,424 feet; steel, 59,207 feet; wood, 303,848 feet; total, 365,479 feet=69 miles.

The crop returns have been estimated and the following table gives the best information available concerning these:

Operation and maintenance results, 1909, 1910, and 1911.

	1909 20 projects.	1910 22 projects.	1911 23 projects.
Area irrigated:			
Under water-right applications (acres)	176,942	208,318	270,459
Under rental contracts, etc. (do)	233,686	265,105	297,937
Total irrigated (do)	410,628	473,423	568,396
Total number acres irrigable	730,601	917,751	1,015,494
Number of farms irrigated	9,503	11,676	13,708
Number of water-right applications	3,657	5,325	9,528
Number of miles of canals operated	2,993	3,945	4,853
Cost of operation and maintenance:			
Total	$936,433	$981,966	$1,058,238
Per acre	$2.28	$2.07	$1.88
Value of crops:			
Total	$11,920,663	$12,974,639	$13,121,224
Per acre	$29.10	$27.50	$23.30
Population of farms	53,812	63,149	69,638
Quantity of water diverted to land:			
Acre-feet	1,523,638	1,655,696	2,079,033
Per acre	3.7	3.5	3.7

Public Resolution No. 56, approved August 24, 1912, provides for payment from the reclamation fund, to the extent of $42,000, of claims for labor, supplies, materials, or cash furnished to the contractor or subcontractor and used in the construction of the Corbett Tunnel, a part of the works constructed for the Shoshone reclamation project. The time fixed by the Department for the presentation of such claims expired November 4, 1912, and the verification of them for certification to the Secretary of the Treasury, as required by the resolution, is now being made. The amount appropriated by Congress will be insufficient to pay all claims in full.

BUREAU OF MINES.

The general purpose of the Bureau of Mines is to conduct, in behalf of the public welfare, fundamental inquiries and investigations concerning the mining industry. The two phases of the industry that are of greatest national importance are safety and efficiency—safeguarding the lives of the miners and insuring the most efficient development and use of our mineral resources. Hence, the function of the bureau may be defined as the conducting of inquiries and investigations that have for their purpose the improvement of health conditions and the increase of safety, efficiency, and economic development in the mining, quarrying, metallurgical, and miscellaneous mineral industries of the country.

The act of Congress (36 Stat., 369) that established the bureau not only outlined the bureau's duties but transferred to it from the Geological Survey the work of analyzing and testing coals, lignites, and other mineral fuel substances, and of investigating the causes of and the means of preventing mine explosions.

The investigations conducted by the bureau during the past year have been confined mainly to two groups: The study of fuels belonging to or used by the Government, and inquiry into the causes of accidents in mines and the most feasible means of preventing such accidents.

The first of these groups of investigations, for the conduct of which Congress made an appropriation of $100,000, has had to do primarily with the purchase, for the use of the Government, of coal aggregating in cost about $8.000,000; the most efficient methods of using this coal at the various heating, power, and lighting plants of the Government and on board government ships; and the safest and most efficient methods of storing coal for the Government at power plants, naval stations, and army posts. In the course of these investigations a large number of steaming tests were made with different coals and, in addition, more than 11,500 samples of coal were analyzed in the laboratories of the bureau. Investigations relating both to the efficient storage of coal and to the causes and prevention of spon-

taneous combustion of coal stored in bins or in the bunkers of ships were continued, in cooperation with the Navy Department, at the navy yards at Key West, Norfolk, and Portsmouth, and, in cooperation with the Panama Railroad Company, on the Isthmus of Panama.

In addition to these investigations of coal, the bureau has tested and analyzed a large number of samples of fuel oil in order to determine the suitability of the oils they represented for use as fuel on naval vessels or at government power plants.

The investigations into the causes and means of prevention of mine accidents were continued and extended during the year, but as yet have not progressed to the needs of the coal-mining industry. The causes of mine explosions and the means of limiting or preventing such explosions, methods of rendering safer the use of explosives and electricity in mines, and the reduction of risk from falls of roof, from mine fires, and from mine cars and locomotives were the more important matters investigated.

In carrying on these investigations the engineers of the bureau carried on laboratory experiments, examined coal mines in many States, and, at a small experimental mine near Pittsburgh, Pa., made tests to determine under working conditions how gas and dust explosions are caused and how such explosions may be limited or prevented.

In order to provide facilities for exploring mines immediately after disasters, while the mines are full of poisonous explosive gases, so that examination may be made while the evidence of a disaster is still fresh, the bureau maintains six safety stations, one each at Pittsburgh, Pennsylvania, Knoxville, Tennessee, Birmingham, Alabama, McAlester, Oklahoma, Urbana, Illinois, and Seattle, Washington, and operates seven mine-safety cars. These cars, equipped as far as practicable with mine-rescue and fire-fighting apparatus, have headquarters as follows: One each at Billings, Montana, Trinidad, Colorado, Evansville, Indiana, Huntington, West Virginia, Pittsburgh, Pennsylvania, Wilkes-Barre, Pennsylvania, and one at Rock Springs, Wyoming, and Salt Lake City, Utah. Each one of these cars moves from point to point, carrying a mining engineer and two experimental miners.

The progress made during the year toward greater safety in mining has been decidedly gratifying. The bureau continues to win the hearty cooperation of mine workers, mine owners, State mine inspectors, and manufacturers of explosives and mine equipment.

The growth of public sentiment in behalf of greater safety in mining and the voluntary efforts of miners and mine operators to improve conditions are evidenced in many ways. In coal mines black powder continues to give place to safer explosives; safety lamps and other safety appliances are being used more and more; improvements in electrical installations are being devised; mine explosions are being better understood and are becoming less frequent;

and more than 16,000 miners have received some training in rescue and first-aid methods.

For the continuance and extension of this work greater facilities should be provided. One more mine-safety car is needed for the metal-mining districts of Michigan, Minnesota, and Wisconsin, and the work of all the cars should be continued throughout the entire year. During the past fiscal year, on account of lack of funds, the training facilities of the cars and stations could be operated at only about 50 per cent of maximum effectiveness. The investigations looking to the prevention of accidents should be extended to include metal mines, quarries, and metallurgical plants. In the various branches of the mineral industry are 1,500,000 men associated with hazardous occupations, who need to be reached and enlisted in the movement for greater safety, and there should be no unnecessary delays in this. The statistical data concerning accidents in the mining, quarrying, and metallurgical industries have been far from complete in the past, and there have always been serious delays in their collection and publication. In many parts of the country no such statistics are collected, but the assembling of the data is essential to the formulation of intelligent plans for preventing mine accidents. There is, therefore, serious need that the Bureau of Mines be enabled to collect and publish statistical data with a degree of thoroughness commensurate with the importance of the subject.

The work of the bureau needs to be enlarged to include investigations into various branches of the mining industry, with a view to lessening the waste of essential mineral resources. In view of the present great losses in coal mining, and of waste in metal mining and metallurgical industries that ranges from 10 to 50 per cent of the total production, the value of such investigations would unquestionably prove beneficial to the whole country. In dealing with mineral resources, in contrast to rainfall, forests, or agricultural products, it should be understood that of mineral wealth the Nation has only one supply, which, when exhausted, it can not replace.

Attention is again called to the fact that the buildings and grounds at Pittsburgh now occupied by the Bureau of Mines for its investigations are inadequate for its needs, unsuited to its purposes, and are held subject to the wishes and needs of another department of the Government. This situation should be remedied in a manner commensurate with the importance of the work of the bureau.

OFFICE OF INDIAN AFFAIRS.

The functions which the Department of the Interior exercises with regard to Indian affairs are among the most important and at the same time the most difficult in the entire Government service.

The difficulties inherent in the problems themselves, considered without reference to outside influences and interferences, are exceedingly great. They are enormously enhanced by these outside influences and interferences. If the Indians now living in this country were located in a territory set apart for their exclusive use from which all white men not engaged in the performance of official duties connected with the Indians were absolutely excluded, and if all forms of trading by white men with Indians were strictly prohibited, the problems of administration would tax the wisdom and the executive ability of the most experienced and disinterested men. Even under such conditions, to care for the Indians and to fit them morally, intellectually, and industrially for future citizenship would be a task of huge proportions. Under the conditions which in fact prevail this task becomes tremendous. The Indian is not thus isolated; he can not be thus isolated. In spite of all disadvantages it is probably best for him that he should not be thus isolated. Nevertheless, the lack of isolation deprives him of much of the protection which its presence would afford. It exposes the Indian and the Indians' property to the cupidity of white men, which interferes on every hand and at every turn with the successful and efficient administration of Indian affairs.

The Indian lands which are still under varying degrees of governmental control through the Office of Indian Affairs, are valued at over half a billion dollars. This property is of every sort and character. It embraces agricultural lands suitable for cultivation by ordinary methods; lands which must be cultivated by means of irrigation; lands suitable for grazing; timber lands of all sorts; oil lands, gas lands, and asphalt lands; lands containing coal and other minerals, and water-power sites of great potential value. All of the great and perplexing problems of public policy which confront the Nation in the disposition and development of the public domain press for solution on the Indian Service. They are problems not merely of the future but of the present, for the Indian's property is being held not merely for future disposition, but is in large part being administered now so that it may produce the revenues for his support and education, and so that through its investment and use he may be taught and may be made a self-reliant and self-supporting member of the community. His timber is being sold and cut; his surplus grazing lands are being leased; his coal is being mined; his oil is being pumped; his fields are being irrigated and cultivated. As rapidly as he can be helped to develop the capacity for self-control and self-support his lands are allotted and his moneys are distributed. Meanwhile, those who have not yet demonstrated the capacity to protect and support themselves; those who adhere to primitive ideas and modes of life; those

who are yet in the early and transitory stages toward industrial civilization; and those whose appetites and desires make them the easy prey of the unscrupulous and the designing must be kept under wise and helpful supervision, and be furnished with such moral, intellectual, and industrial training as their circumstances permit.

The whole problem thus presented is one calling for business and executive ability of the highest order, coupled with sound and far-seeing views of public policy and a keen understanding of and deep sympathy with the sociological questions involved on the human side. It is important that the Nation and especially that Congress shall clearly understand the conditions under which the Department of the Interior is called upon to administer the affairs of its Indian wards. If all Indians were fully qualified to receive and to manage or control their appropriate shares, and if there were no other questions involved than those relating to the prompt and just distribution of adequate allotments among this number of persons, the task would be one of great importance and difficulty. When, however, among the persons interested in the property there are many minor children for whom some protection or guardianship would have to be provided, the difficulty of the task is immensely increased. When, in addition to this, many of the adults are unwilling or reluctant to receive their allotments of the property, when they are ignorant of or indifferent to its value and have no desire to assume the responsibilities of self-support under modern industrial or agricultural conditions and yet are likely to become pauperized and dependent upon the community if their property is lost or neglected, the seriousness of the problem is immediately increased. But even a problem such as is thus finally presented is simple compared with the problem which really faces the Indian Service. The human interests confided to its charge are of even greater complexity and difficulty than are the property interests, and the two are inextricably connected. We are attempting to adjust a primitive people to the conditions of modern industrial civilization, and we are doing this with all the difficulties inherent in the problem increased a thousandfold by the cupidity and greed of those who are waiting at every turn to acquire the Indian's property and to profit in every possible way by trafficking with him.

GENERAL ADMINISTRATION.

Even a superficial examination of the personnel and administrative methods of the Indian Service discloses the fact that its chief defect is in the absence of an adequate staff organization at the head of the service. The Commissioner of Indian Affairs receives a salary not at all commensurate with the qualifications which he should possess and the work he should perform, and if it be thought that the honor and authority of being at the head of this important service

to some extent make up this lack of money compensation, nothing of this sort can be said for the heads of divisions immediately below the commissioner in rank. It is only necessary to point out that the Commissioner of Indian Affairs receives a salary of $5,000, the assistant commissioner a salary of $3,500, that no other of the assistants or clerks on the statutory roll of the commissioner's office at Washington receives more than $2,250 a year, and that the supervising force thus provided at the head of the service is absolutely unable effectively to direct and check the great mass of important work which must be performed by the field force. Transactions involving immense sums of money, property of enormous value, and principles of far-reaching consequence must be determined largely upon the recommendations of clerks who are paid from $1.800 to $2,250. It is surprising that the results are as good as they are upon the whole. It is not surprising that serious mistakes occur.

What the Indian Service imperatively needs is an increase in the number of first-class men in the responsible directing positions, and this can be obtained only by increasing the number and the compensation of such positions. An effective force at the head of the service might easily permit a substantial diminution in the lower clerical positions. If it did not permit such a decrease it would be solely because an improved clerical force of the present size is imperatively required for the proper conduct of the Indian administration. Under the present system it is most difficult to secure officials of the proper qualifications, and especially to retain in the service those who demonstrate that they possess such qualifications. Competent and ambitious men soon reach the limit of promotion and seek employment elsewhere. There are many excellent employees in the Indian Service, but it is nevertheless broadly true that under existing conditions the Indian Service does not attract the kind of men who are essential to its proper administration. The very fact that it is so difficult to obtain or keep men of the right sort has led to methods of administration which are not calculated to promote efficiency. This is especially true of the system of administering punishment and enforcing discipline by shifting men from one position to another rather than by discharging them from the service. The plea for leniency in punishing dereliction in such cases which comes up from the service again and again is based on the difficulty of filling positions. There are approximately 6,000 employees in the Indian field service, and the number of positions filled by resignations, transfers, etc., amount to over 4,000 in a single year. I have heretofore urged upon Congress such changes in the annual appropriations as will enable the Department to establish the policy which the considerations stated make desirable.

If we are to have this problem wisely and efficiently handled, some important changes must be made in the methods and organization of the Indian Office. The necessity for such changes was forcibly brought to my attention a year ago, and I should then have undertaken a thorough investigation for this purpose if conditions had permitted. At that time, however, the House Committee on Expenditures in the Department of the Interior had entered upon a series of hearings or investigations of the previous administration of the Indian Office. In the hope that this investigation would lead to definite suggestions with regard to the organization and future administration of the office and that some constructive report would be made during the past year, and desiring to avoid even the appearance of seeking to interfere with that investigation or to anticipate that report, I undertook no comprehensive inquiry of my own. My conclusions have been drawn from participation in and observation of the routine work of the Indian Office. I regret that the House Committee has made no report and that its investigations have been so largely devoted to specific complaints instigated by persons who have or think they have grievances against the Indian Office or its officials. Too many of these complaints have obviously been inspired by motives of resentment or of self-interest. It is important to unearth scandals and discover serious mistakes of judgment on the part of Indian officials, if such scandals or mistakes exist; but what is really needed is a comprehensive inquiry into the methods in vogue in Indian administration, the conditions under which it has been carried on, and the appropriate means to be employed for the improvement of these methods and conditions. The principal object of Indian administration is to bring the individual Indians as rapidly as possible to a condition where they can be self-supporting and self-reliant and to distribute their property to them as rapidly as this can be brought about, protecting them meanwhile from those who would ruthlessly despoil them of their property and of their moral and physical health for the sake of the ill-gotten gains to be thus derived. The Office of Indian Affairs can be much better organized and equipped for the accomplishment of this object.

REMOVAL OF RESTRICTIONS.

We wish to have the Indian become a self-supporting and self-reliant citizen as rapidly as possible, and in order to accomplish this the individual Indian must have placed upon his shoulders the very largest responsibility for the management of his own property and affairs that can be conferred upon him without overburdening his present powers or making him the prey of the unscrupulous. To

this end the policy of the Department has been to break up the pernicious system of individual rations and to make separate allotments of land to individual Indians as rapidly as possible. Nevertheless, to allot lands by wholesale or without reasonable precautions would lead only to disaster. The allottee must have some capacity and some desire to cultivate or appropriately utilize the land allotted to him. In many instances he has no such desire; in others he has not sufficient training.

During the past year instructions have been issued to utilize to the fullest extent that experience will justify the individual Indian's moneys which are now on deposit in the banks and amount to more than $10,000,000. The general policy thus adopted was the discontinuance of monthly payments, except in cases of absolute necessity, and the free use of Indian funds by the fully competent Indians entitled to them, while less competent Indians were given increased privileges under official supervision. The superintendent was authorized to make requests covering the needs of individuals for an entire year instead of sending in numerous requests for individual expenditures. Issuance of these instructions has been followed by a deluge of requests (numbering about 125 daily) for authority to make payments amounting to a daily average of $20,000. The work, however, is being handled promptly and is being given close attention with a view to its extension as rapidly as experience will justify. Similar principles are being applied in passing upon requests to permit Indians to make their own leases. It is apparent, however, that this policy has its wise and necessary limitations, for it can work only injury to many able-bodied adult Indians to permit them to rent their lands and to live in idleness upon the rentals.

EDUCATION AND TRAINING.

It is the constant effort of the Department to induce the Indians to become agriculturally and industrially self-supporting. Indian schools are increasingly conducted upon this principle. The enrollment in government schools for the fiscal year ended June 30, 1912, was 26,966, an increase of 3,000 pupils; and when the reports for the fiscal year 1912 have been compiled, it is thought that the total number of Indian pupils enrolled in public schools will exceed 14,000. The total monetary value of the Indian schools is estimated at $12,000,000, and the annual government expenditure for education of Indian children is a little over $4,000,000. It is, however, the established policy of the Department to turn over to local authorities the education of the Indians as rapidly as conditions will permit, and this has been largely accomplished in some localities. The conditions, however, will for some time continue to be such as to require the maintenance of many government schools for the educa-

tion of the Indians in localities where the common schools are not and can not now be made available.

Instruction of both minors and adults in practical agriculture is being given especial attention by increasing the number of experienced farmers doing house-to-house work among the Indians. This work has also been stimulated greatly through the encouragement of Indian fairs, by the establishment of Indian agricultural societies, and the holding of farmers' institutes on Indian reserves. More than 30 successful Indian fairs have been held this fall, and in every case reported the fair is said to have had a stimulating effect upon both the amount and quality of farming and stock raising done by Indians.

Reports with regard to the live-stock industry on the Navajo Reservation and upon some of the other reservations are encouraging. The agricultural progress in Oklahoma, the Dakotas, and Nebraska has been noteworthy. This has been accompanied by an increase of prosperity, a rise in the scale of civilization, and a marked decrease in drunkenness. Unfortunately, upon some reservations the old tribal or communal habits of the Indian and his consequent frequent repugnance toward industrial physical labor have retarded progress of this character. In other instances the lack of available funds to complete irrigation projects, to purchase agricultural implements, and to make necessary improvements has prevented the economic and social development of Indians who would otherwise have given excellent account of themselves.

TAXATION OF INDIAN LANDS.

The local white communities on or near Indian lands frequently have justifiable grounds for complaint in the fact that these lands are withheld from development and from taxation. This frequently encourages local sentiment which condones unfair or even illegal methods of separating the Indian from the ownership of such property, and while it furnishes a potent reason why the enforcement of Indian rights frequently can not safely be intrusted to local officials, it makes it all the more imperative that the Indian lands should be opened to general development and especially to local taxation as rapidly as practicable. In this connection it has been found that Indians who are competent to receive patents in fee often do not apply for these patents because they desire to avoid subjecting their lands to taxation until a sale has actually been made. The applications for patents have been found in most cases to be connected with contracts of sale already made. To cure this abuse steps are being taken to issue patents without request to Indians who should have applied for them. Instructions have recently been issued to superintendents to report all cases of competent Indians who should have patents in fee and have failed to apply for the same.

DETERMINATION OF HEIRSHIPS.

Substantial progress has been made in expediting the determining of Indian heirships and the issuance of farming and grazing leases; the number of Indians who have the privilege of leasing their lands free of departmental control having been more than doubled since the passage of the act of June 25, 1910. Copies of such leases, however, must be filed with the superintendent of the reservation and in the Indian Office as a check against fraud. Practical experience has justified a liberal policy in this matter, and the policy is to increase the number of Indians who are given the leasing privilege just as rapidly as is consistent with the conditions in each individual case.

SANITATION AND HEALTH.

The special investigation of the sanitary and health conditions among the Indians, the result of which was reported by you to Congress at its last session, sufficiently emphasizes the alarming need of increased appropriations and increased supervision of this work. This year's statistics show that out of 61,500 Indians examined, 8,394, or 13.6 per cent, were suffering from tuberculosis, while 9,254, or 15 per cent, were suffering from trachoma. Thirty-two per cent of the whole number of deaths reported from the various reservations were due to pulmonary tuberculosis as against 11.2 per cent of deaths due to this disease occuring in the registration area of the United States; this registration area includes 21 States, with a population of 51,690,975 white and 2,152,911 colored people. The death rate among Indians from all causes is estimated to be 30.24 per thousand, while the Census Bureau reports 15 per thousand as the death rate in the above registration area. A hospital is just being completed at the White Earth Reservation and others are in process of construction at Wahpeton, North Dakota, and Zuñi, New Mexico. In 1914 the Department needs at least $155,000 for additional hospital facilities besides an appropriation of $250,000 for the general sanitary and medical work. The Department is using its present resources for this important work to the fullest extent possible.

EMPLOYMENT OFFICE.

Systematic efforts are made to find employment for Indian students who are returning from the large boarding schools and for other unemployed Indians. The supervisor of employment has for several years had headquarters at Denver. It is especially important to have the educated Indian promptly and properly employed, both on his own account and as an example and stimulus to others. Substantial results have heretofore been accomplished in this direction, but much more can be done. The maintenance of the office of the supervisor

away from Washington has tended to unnecessary duplication of work in making reports and securing information, and the inspectors in the field have not been given as comprehensive a range of duties as they are capable of performing. This concentration of the responsible directing heads of the Indian work at the central office in Washington and the discontinuance of overspecialization in the work of the inspecting field force is being generally applied to the service in the belief that it will concentrate responsibility and increase efficiency.

ENFORCEMENT OF LIQUOR LAWS.

Constant difficulties are encountered with regard to the suppression of illegal sale of liquor to Indians, for which work an increase of $50,000 for the fiscal year 1914 is being earnestly requested. There are now 11 special officers and 4 constables regularly employed, besides the chief special officer, 2 assistant chief special officers, and 184 deputies, employed as occasion requires. The attention of the Department having been called to the fact that absolute prohibition of the use of liquor has not heretofore been enforced among employees on Indian reservations, an order enforcing it has been issued. Heretofore efficiency in suppressing the Indian liquor traffic has apparently been estimated chiefly by the number of arrests and convictions made by the special employees. This led the special officers and employees to take action which was frequently ill considered. To prevent this, the control of the field force has been systematized, and the attention of all field employees among the Indians has been called to their direct responsibility in the matter of preventing the use of liquor by Indians, instead of leaving the liquor traffic to be prevented by prosecutions instituted by the special liquor officers and their deputies. The extent to which the liquor traffic is suppressed upon a particular reservation is to be made one of the principal items in determining the efficiency rating of the superintendent and regular employees of that reservation.

TIMBER LANDS.

The value of the timber resources on Indian lands is over $80,000,000. This timber is of widely different character and situation. Its proper care and administration involves all the methods of timber conservation and disposal from the prevention of fire to the operation of the Menominee Indian mills, which made a net profit of about $140,000 during the past year. On the Klamath Reservation applications have been received for the purchase of timber amounting to 400,000,000 feet, of which 1,500,000 feet have been sold at $3.25 per thousand, and an additional 10,000,000 feet are being advertised for sale at this price as a minimum. On other reservations sales are under consideration or sawmills are under construction.

IRRIGATION WORKS.

The irrigation work now in progress under the Indian Service is of itself of such magnitude as to be worthy of a more detailed treatment than is at all possible within the necessary limitations of this report. The Indian appropriation act for the fiscal year 1913 provides for the following expenditures in connection with the irrigation of lands on various Indian reservations:

Appropriations for irrigation work on Indian reservations, fiscal year 1913.

Fort Mojave Reservation, Arizona	$25,000.00
Colorado River Reservation, Arizona	35,000.00
Nomadic Papagoes, Arizona	5,000.00
Papago Reservation, Arizona	5,000.00
Ganado irrigation project, Arizona	35,000.00
Fort Hall project, Idaho	20,000.00
Fort Belknap, Montana	15,000.00
Klamath Reservation, Oregon	50,000.00
Uintah Reservation, Utah	75,000.00
Yakima Reservation, Washington	15,000.00
Wind River Reservation, Wyoming	75,000.00
Pierre School, South Dakota	4,000.00
General fund, irrigation Indian reservations	335,700.00
Work under construction by the United States Reclamation Service in cooperation with the Commissioner of Indian Affairs:	
Gila River Reservation, Arizona	15,000.00
Yuma allotments, California	52,362.62
Flathead Reservation, Montana	200,000.00
Blackfeet Reservation, Montana	100,000.00
Fort Peck Reservation, Montana	100,000.00

In addition to the appropriations above noted, a considerable sum is being expended each year from tribal funds in the maintenance, operation, and extension of the irrigation systems on the Crow Reservation, Montana.

Of the above-mentioned projects noted as under the Indian irrigation service, the Fort Mojave and Ganado are new projects; Colorado River, Yakima, and Klamath are partially completed, and five of the most extensive and important projects, viz, Fort Hall, Uintah, Wind River, Fort Belknap, and Crow projects, are practically completed, and irrigation work on these reservations is now simply a matter of maintaining and operating the existing systems, and of seeing that they are beneficially utilized, with extensions of the sublateral systems when necessary to cover such additional lands as may be subsequently brought under cultivation.

It is of the utmost importance that active measures be taken to put as large an acreage of the Indian lands as possible under cultivation within the next few years, to the end that the Indian water rights may be protected without litigation arising from failure to

comply with the provisions of the irrigation laws of the various States relative to the time limit for making beneficial use of the water appropriated.

In addition to the necessary apportionment in connection with the general supervision of all irrigation work performed upon Indian reservations, the general irrigation fund has been mainly apportioned to irrigation construction, maintenance, miscellaneous investigations, etc., in connection with various Indian reservations in Arizona, California, and New Mexico, where the Indians have no tribal resources, which could be utilized for irrigation work, as follows:

Papago Reservation, Arizona.
Salt River Reservation, Arizona.
Camp McDowell Reservation, Arizona.
Navajo and Moqui Reservations, Arizona and New Mexico.
Capitan Grande Reservation, California.
Cahuilla Reservation, California.
Morongo Reservation, California.
Pala Reservation, California.
Rincon Reservation, California.
Soboba Reservation, California.
Santa Rosa Reservation, California.
Zuñi Reservation, New Mexico.
Pueblo Reservations, New Mexico.

More or less irrigation work is being performed on all the above reservations, and in nearly all cases the work is of a permanent character, and should be carried forward to completion at an early date. In the past the representatives of the Indian irrigation service have had charge of the maintenance of ditches after the projects have been completed. I believe better administration will be promoted by having the maintenance of a given project turned over to the superintendent in charge of the reservation immediately upon completion of the project, competent engineers, of course, being employed under such superintendent to construct necessary laterals to reclaim specific allotments.

GRAZING LEASES.

On September 1, 1912, joint regulations of the General Land Office and the Indian Office were made effective to cover approximately 6,000,000 acres of ceded Indian land. These regulations were the result of a decision by the Department in November, 1911, to the effect that Indian lands opened for settlement were to be held for the Indians until settled or sold and that the Indians were entitled to the use, or proceeds of any use, thereof. Grazing permits have already been issued to cover a large part of this territory at a minimum rate of $1 per head for cattle and 20 cents for sheep. This arrangement, it is believed, will result in much better control of the grazing conditions

on these lands, besides giving substantial returns to be used for the benefit of the Indian tribes interested.

OIL LEASES.

Many of the Indian lands contain valuable deposits of oil. These deposits are not confined to the Five Civilized Tribes but occur in the Osage country and in other Indian lands in Oklahoma as well as in some of the Wyoming reservations. In general the development of these properties is beyond the financial capacity of the Indians themselves, and Congress has not authorized the Department to attempt direct development, but has given it some measure of control over the making of leases either by individual Indians in case of allotted lands or by the tribes in case either the land or the oil is tribal property. The exercise of this control involves many difficult business problems as well as some questions of governmental policy of great importance. Considerable progress has been made in this regard, both in getting the best return possible for the Indians and in handling the leases in such manner as not to run counter to general policies of the Government.

INDIAN SUPPLIES.

The purchase and distribution of supplies for the Indian Service are being systematized and improved, especially by the adoption of standard specifications and the revision of the proposal blanks, as well as by the prompt payment of supply claims through the disbursing officer of the Department of the Interior. The Indian Office reports that during the present fiscal year every claim presented has been examined and a check issued within 20 days after the claim has reached the office. Formerly payments were frequently delayed from 60 days to 6 months after the goods had been delivered to the warehouse. Prompt payment is expected to increase competition and to lower prices. Other improved methods of handling Indian supplies are being developed. The total amount expended for such supplies during the past fiscal year was $3,082,639.47, of which over $1,225,000 was expended through the five Indian warehouses. The total number of shipments made through the warehouses was 221,656; the total weight of such shipments was 49,857,085 pounds; and the total cost of warehouse maintenance was $55,751.67.

TRADERS' CLAIMS.

As illustrative of past and present administrative conditions in the Indian Service, about 80,000 traders' claims against Indians were filed in the Indian Office during 1910 and 1911 from 60 superintendencies. These claims are held by some 2,500 creditors and

amount to more than $1,700,000. The office has been involved in immense correspondence on account of these claims, the continuance or repetition of which it seeks to avoid by paying those claims that are rightly due from Indians who have individual funds to their credit, and compelling traders to confine their future traffic with the Indians to a cash or authorized credit basis. Just claims against Indians who have no individual funds must be taken up for future disposition upon some basis which Congress may authorize.

RELIGIOUS WORK AMONG THE INDIANS.

One of the most difficult and yet one of the most important duties of the Indian Office is to determine the conditions under which the observance and teaching of religion shall be conducted among or by the Indians. The taking over by the Government of Indian schools previously established and conducted by religious organizations has greatly complicated the situation. During the past year a serious controversy arose out of the fact that 51 out of approximately 2,000 teachers and employees in Indian schools continued to wear the distinctive garb of the religious orders to which they belonged. By your direction a full hearing was given all the parties in interest, and the conclusions which were reached after much deliberation were fully stated in a letter of instructions from the Secretary of the Interior to the Commissioner of Indian Affairs, dated August 24, 1912, which letter was approved by you. I believe that the complete discussion contained in this letter and in your statement of approval is necessary to convey a proper understanding of the issues involved and of the decision reached. Printed copies of the letter of instruction can be obtained by those who desire them. Copies have been distributed in the Indian Office for the guidance of administrative officials having to do with this and similar questions.

FIVE CIVILIZED TRIBES.

TRIBAL AFFAIRS.

The work of allotting lands to over 101,000 citizens is practically completed, although there remains considerable work in connection therewith, such as the preparation and delivery of certain allotment deeds and equalization of allotments. Rapid progress is now being made in disposing of remaining tribal lands and property and winding up tribal affairs.

Allotments to Seminoles have been completed. Of the surplus unallotted lands 3,543 acres have been sold for $37,285.37 on deferred payments. There remain a few tracts, aggregating 160 acres, which will be sold in the near future. Allotment deeds have been prepared and are being delivered, except in specific cases where con-

veyances have been obtained from the Indians fraudulently or for inadequate consideration. There are two tribal boarding schools with 320 acres of land each, the Seminole agreement providing for their continuance by tribal moneys set aside as a permanent school fund for the education of the members of said tribe; only one of these schools has been maintained during the past year.

Allotments have been made to all Creeks. Of the unallotted lands 62,167 acres have been sold for $378,197 on deferred payments. The remaining unallotted lands, aggregating 1,553 acres, will be sold in a short time. There are 17,708 Creek citizens having amounts due them averaging $370 each, aggregating approximately $6,900,000, to equalize their allotments on a basis of $1,040 each, as provided by the agreement. These amounts can not be paid, as the total of the Creek tribal funds is only about $3,400,000. By the act of Congress approved March 3, 1909, provision was made for the equalization of Creek allotments upon a basis of $800, with a condition precedent, however, that the Creek National Council should pass an act in form approved by the Secretary of the Interior, discharging the United States from any further claim on this account. The Creek Council rejected this proposition. Therefore, the matter of equalizing these allotments remains unsettled pending further action by Congress. Four tribal boarding schools with 40 acres of land each are now being maintained. There are also 219 town lots remaining unsold.

The completion of allotments to Cherokees has been delayed by litigation affecting allotments of certain minors and a certain class of freedmen. This litigation has recently been determined by decisions of the United States Supreme Court, holding that the minors were entitled to allotments and that certain freedmen were not. Final allotments have been made and deeds prepared during the year are now being delivered to 4,400 of the 5,605 minor citizens affected, and allotments affected by the decision in the freedmen case are being adjusted. The payment of about $892,000 to 1,205 minors, receiving no allotments, and others having various amounts due them owing to exhaustion of land, is now in progress. There remain about 625 acres of land, together with 15 town lots, to be disposed of. There are also 272 rural cemeteries of from 1 to 3 acres each. One tribal boarding school, together with 40 acres of land, is still maintained from tribal funds. All other remaining unallotted lands, aggregating 49,765 acres, have been sold for $179,828, final payments on which are due in November and December, 1912.

Allotments to the Choctaws and Chickasaws have been completed, with the exception of several cases involved in litigation. There have been sold at auction 834,071 acres of the unallotted lands of these nations for $5,655,501, final payments on last sale being due in January and February, 1914. There remained on July 1, 1912, approxi-

mately 2,621,200 acres, including 432,585 acres of segregated coal and asphalt lands and almost 1,300,000 acres of the so-called timber reserve to be disposed of; 817,000 acres of the unallotted lands, together with 10,800 acres of timber land, have been advertised to be offered for sale in November and December, 1912. In addition thereto there are the reserved coal and asphalt deposits; 101 cemeteries, containing from 1 to 20 acres each, aggregating 600 acres; 2,194 town lots; 6 tribal schools, with 160 acres of land each, which are now maintained with tribal funds; 2 boarding schools, with 160 acres of land each, not now used, and the Choctaw capitol building, with 5 acres, all of which are still tribal property.

It has been found impossible properly to complete the survey and appraisal of the surface of the segregated coal and asphalt lands within the time allowed by the provisions of the act of Congress of February 19, 1912, as subsequently amended. It therefore seems advisable for Congress immediately to enact legislation extending the time for the appraisal, and also providing that the appraised lands may be offered for sale as they are appraised from time to time, such offerings to be made in large enough amounts at one time to arouse interest in prospective bidders.

There has been paid to equalize allotments of 61,974 allottees of the Choctaws, Chickasaws, and Cherokees $520,852, leaving 11,118 citizens having small amounts still unpaid.

The aggregate of the unallotted lands sold in the Five Tribes amounts to 16,421 separate tracts containing 949,547 acres, the total price being $6,250,811, of which, at the close of the last fiscal year, $3,420,303 had been paid in and was almost all on deposit in various State and National banks in Oklahoma, earning interest at rates varying from 4½ to 6 per cent. The remainder of said purchase price consisted of deferred payments which bear 6 per cent interest.

It has been found, so far, impossible to dispose of the so-called timber reserve in the Choctaw Nation. Although this land has been offered for sale under existing law, yet, doubtless due to the fact that the merchantable timber is very sparse and scattering, averaging less than 1,000 feet to the acre, the bids received have in general been less than the appraised value. There have been some discoveries of manganese ore on parts of these lands, the extent and value of which is still under investigation. So much difference of opinion, especially among the Indians interested, has arisen as to the proper method of disposing of these lands that I deem it proper to call the situation to the attention of Congress, with a view to possible legislation.

The income derived as royalty from the coal and asphalt leases in the Choctaw and Chickasaw Nations amounted to $252,924.97 in the past fiscal year, and the present prospects are that this income will increase in the near future.

In compliance with the provisions of the various agreements, all expenses incident to the work of enrollment, classification, and appraisement of the lands and allotments to individual members from the creation of the "Dawes Commission" in 1893 to June 30, 1912, have been paid by the Government at an average cost per capita of persons allotted of $34.99. No provision was made in any of the agreements with reference to the expense of disposing of lands after allotment; therefore Congress, by act of March 3, 1911, provided that such expenses should be paid from proceeds of sale. The expense of the tribes in connection with the sales of lands to June 30, 1912, amounted to $39,420.90, or an average cost of about 4 cents per acre.

Before tribal affairs can be finally settled legislation will be required with reference to the final disposition of the coal and asphalt mineral, together with tracts reserved for cemeteries. It is also desirable that Congress authorize payments from time to time to enrolled members of accumulated proceeds from sale of unallotted lands and other tribal property, together with the setting aside of specific amounts from tribal funds for the maintenance of tribal boarding schools for such period as their continuance may be thought advisable.

INDIVIDUAL AFFAIRS.

The work of the Union Agency, including the field force attached thereto, is almost entirely among the individual Indians. This individual work has no bearing one way or the other upon the closing or prolonging of tribal affairs.

The territory of the Five Civilized Tribes embraces the eastern half of the State of Oklahoma, originally Indian Territory, and includes 40 counties.

The greater portion—approximately 16,000,000 acres—of the land in this area was allotted to the 101,239 enrolled members of the Five Tribes. The allottees reside in every section of this area, so that each county has its share of Indian population. In order economically and satisfactorily to conduct the business coming before the Department, a field force has been distributed at convenient points, thus enabling the Indians and the public having dealings with them to transact their business before a local officer, and the Department to secure first-hand information from men familiar with local conditions. With the large territory to be covered and the scattered Indian population, if all of the information with respect to the thousands of complicated lease and land matters acted upon each year were secured by sending men from the Union Agency office at Muskogee, the work would not only stagnate but the expense would be almost prohibitive.

It has become the custom to compare all of the Indians of the Five Tribes with the highly educated business or professional man who is Indian only in name. Except that he wears white men's clothes and lives in a log or frame house instead of in a tepee, there is little difference between many full bloods of the Five Tribes and the full bloods of the western reservations. Thousands of them live in a rough, mountainous country, many miles from a railroad, and have no knowledge whatever of business transactions. They need not only every reasonable protection in their property rights but advancement along industrial and general educational lines and a more healthful mode of living. Some of the full-blood Indians in the Five Tribes have absolutely refused to recognize present conditions of abolishment of the old communal tribal property and the substitution of individual property therefor. There are, for instance, nearly 2,000 Cherokees alone who have refused to accept their allotment deeds or take possession of their land, but have withdrawn themselves as far as possible from the well-settled portions of Oklahoma, and are living in the rougher parts of the country as nearly as they find it possible in the manner that their ancestors lived. Many of these Indians will not send their children to school. As the citizenship rolls of the tribe have been closed and no children born subsequent to March 4, 1906, are recognized as members of any tribe or entitled, except as they may inherit property, to any lands or money, there is growing up a class of full-blood Indians who are likely to become illiterate charges on the community unless adequate provision is made for them.

It is estimated that the value of real estate belonging to minor Indians in the Five Civilized Tribes will exceed $150,000,000. Part of this is inherited land, but a large part of it comes from the fact that minors were allotted equally with adults when the allotments were originally made and that most of those minors are not yet of age. This vast amount of property occasions naturally a very large amount of guardianship business which is handled by the probate judges in Oklahoma. There is one judge to each county, and he has certain ordinary civil and criminal jurisdiction so that all his time can not be given to probate work. In consequence the field force of the Union Agency has accomplished a great deal in looking after the interests of the minors. A great majority of the probate judges have commended this work and asked for the continued assistance and cooperation of this force.

The Union Agency has handled up to the close of the past fiscal year many thousands of oil and gas leases on account of individual members of the Five Civilized Tribes, mostly Creek and Cherokee. On June 30, 1912, there were carried on the books very nearly 9,000 accounts of individual Indians with balances aggregating $1,135,033.24. This money was deposited in banks and was earning interest during

the period before its use by or for the benefit of the Indians. Including amounts received from the Treasury for transfer to individual accounts or disbursement, the Union Agency handled $10,701,624.27 during the fiscal year 1912.

Recent decisions of the United States Supreme Court involving conveyances of Indian lands have paved the way for the disposition of a large number of the more than 20,000 suits to set aside illegal conveyances. Some 6,284 of these suits have been dismissed or adjusted. Many others could without doubt be settled if the necessary legislation were enacted to permit adjustments along lines that would do substantial justice to the Indians, which would go a long way toward the straightening out of title conditions in eastern Oklahoma. The Department has made reports to Congress upon different bills seeking to accomplish this end and pointed out the way that it believes these results may be secured and the desirability for such action.

EXPENDITURES.

The total expenditures for all purposes on account of the Five Civilized Tribes during the year from congressional appropriations for administrative purposes were $311,638.98, of which $34,578.18 was used in connection with tribal matters and $277,060.80 for supervising affairs of approximately 35,000 restricted Indians, an average cost of $7.91 per capita, including the district agency service, which is much less than expended for other Indians. Sixteen thousand two hundred and ninety-five dollars and thirteen cents was received as fees and used in the preparation of certified copies of records. There were expended from tribal funds the following amounts: $86,992.63 for expenses in connection with the sale of unallotted lands and collection of tribal revenues, the proceeds of which amounted to $1,782,876.08; $90,384.23 in payment of salaries and expenses of tribal attorneys under contracts approved by the President, and for tribal officers authorized by law; $2,073,761.60 for various special purposes authorized by Congress, including $2,007,670.68 to individual Indians as per capita and equalization payments. In addition thereto $339,859.90 was expended for education. There was collected for and paid to individual Indians, or placed to credit of tribes, amounts aggregating $6,172,594.55.

PENSION OFFICE.

At the beginning of the fiscal year ended June 30, 1912, there were 892,098 pensioners on the roll. There were added thereto during the year 23,311, made up of original allowances, restorations, and renewals. There were dropped therefrom 55,115, occasioned by death, remarriage, minors attaining the age of 16 years, failure to claim for three years, and all other causes, making a net reduction in

the roll of 31,804, and leaving the total number on the roll at the close of the year of all classes 860,294, of whom 538,000 were soldiers and sailors, 321,932 were widows and dependents, and 362 were Army nurses.

The unexpended balances of the appropriations at the close of the fiscal year covered into the Treasury were as follows:

Unexpended balances, Pension Office, fiscal year 1912.

For pensions	$18,294.17
For medical examinations	29,233.00
For salaries and clerk hire, pension agencies	8,349.22
For rent and contingent expenses	2,251.39
For salaries, Bureau of Pensions	21,706.58
For salaries, per diem, and expenses of special examiners	2,499.33
Total	82,333.69

The amount expended for pensions during the year was $152,986,433.72, a decrease as compared with the previous year of $4,338,726.63. The cost of administration in connection with the adjudication of claims and the payment of pensions was $2,448,857.31. This is a reduction in the running expenses of the bureau and agencies of $68,269.75 as compared with the previous year and is the smallest amount paid for such administration in any one year for 30 years.

The amount due and unpaid at the close of the year on certificates issued during the fiscal year 1912 was $514,631.36. The appropriation became exhausted a short time before the close of the year, but as all amounts remaining unpaid at the close of the year were paid as soon as the new appropriation became available on July 1, 1912, there was no deficiency created. The only embarrassment which resulted was a slight delay of a week or 10 days on the part of a small number of pensioners in the receipt of the pension due on new certificates issued toward the close of the year.

The appropriation for the fiscal year 1913 is $164,500,000. It is estimated that the amount required for the fiscal year 1914 will be $185,000,000, an increase of $20,500,000 over the year 1913. This increase is due to the increase in rates carried by the act of May 11, 1912, providing increased rates on account of service during the War with Mexico and at certain ages on account of service during the Civil War.

There was disbursed for pensions from July 1, 1790, to June 30, 1865, $96,445,444.23. From July 1, 1865, to June 30, 1912, the total disbursements for pensions have been $4,286,922,719.65. The expenses and cost of maintenance for the same period were $123,328,719.05, making a total of disbursements since July 1, 1865, of $4,410,251,438.70.

There have been granted since 1861, by special acts of Congress, 39,472 pensions and increases of pensions, of which number 22,084 are now on the roll, calling for the payment of $6,584,572 annually. Only a part of this amount, however, is properly chargeable to special acts, as most of the beneficiaries had been previously pensioned under the general laws at lower rates. Up to and including June 30, 1912, during the second session of the Sixty-second Congress, 3,485 persons were pensioned by special acts.

The largest number of pensioners on the roll at the close of any fiscal year was June 30, 1902, when the total number was 999,446. There has been a decrease of 139,152 in the number of pensioners since that date and the number is now less than at any time since 1891.

The recommendations made by the Commissioner of Pensions in his annual report for the fiscal year ended June 30, 1911, were enacted into law and are contained in the act approved August 17, 1912. That act provides for the abolishment of the pension agencies from and after January 31, 1913, and for the payment of pensions after that date by a disbursing clerk in the Bureau of Pensions. It is expected that after the establishment of the system of paying pensions without vouchers and the payment thereof by a disbursing clerk in the Bureau of Pensions there will be a reduction in the cost of administration amounting to about $250,000 per annum. The first payment of pensions by the disbursing clerk in the Bureau of Pensions will be made for the quarter ending February 4, 1913, and it is expected that all checks for pensioners whose quarterly payments become due on that date will be ready for mailing on the morning of February 4, 1913. In this act it is provided that pensions, with certain exceptions, shall be paid by checks without separate vouchers.

At the close of the year the number of pending applications of all kinds was 422,464 as against 36,793 pending at the beginning of the year. The increase is due to the large number of claims filed under the act of Congress approved May 11, 1912, which grants pensions according to the length of service to persons who served 90 days or more in the military or naval service of the United States during the Civil War and were honorably discharged, who have reached certain ages, at rates as indicated in the following table:

Rates under act of May 11, 1912.

Age.	Length of service.						
	90 days.	6 months.	1 year.	1½ years.	2 years.	2½ years.	3 years.
62 years	$13.00	$13.50	$14.00	$14.50	$15.00	$15.50	$16.00
66 years	15.00	15.50	16.00	16.50	17.00	18.00	19.00
70 years	18.00	19.00	20.00	21.50	23.00	24.00	25.00
75 years	21.00	22.50	24.00	27.00	30.00	30.00	30.00

It also grants pensions at the maximum rate, $30 per month, without regard to age or length of service, to persons who served in the military or naval service during the Civil War and received honorable discharges and who were wounded in battle or in line of duty and are now unfit for manual labor by reason thereof or who from disease or other causes incurred in line of duty resulting in their disabilities are now unable to perform manual labor. It also provides a rate of $30 per month for surviving soldiers and sailors of the Mexican War who served 60 days or more and were honorably discharged.

The Commissioner of Pensions reports that between the approval of this act and the close of the fiscal year 406,048 applications for pension were filed thereunder, and that before the end of the year 13,404 certificates had been issued under said act.

The total number of applications filed during the year was 508,812; and during the year 116,668 claims were adjudicated, of which 91,120 were admitted, 24,925 rejected, and 623 approved in which no certificates were issued because they would not have benefited the applicants.

Allowances of accrued pension were made in 19,493 cases, being issues for payment in case of deceased pensioners from the date of last payment to the date of death.

Since the passage of the act of March 3, 1899, providing for a division of pension of resident pensioners of the United States who shall desert their wives or minor children or who are inmates of National or State soldiers' or sailors' homes, 14,021 claims have been filed thereunder, 7,675 of which have been allowed and 6,182 rejected, leaving 164 pending.

During the year 5 original bounty-land warrants were issued, granting 720 acres of land. The total number of such warrants issued to the close of the fiscal year 1912 was 598,690, granting 68,792,270 acres.

At the beginning of the year there were 1,427 claims for reimbursement of the expenses of the last sickness and burial of deceased pensioners pending; 7,605 such claims were received during the year, and 133 which had been disallowed were reopened, making a total of 9,165. Of these, 6,005 were allowed, 1,126 disallowed, and 814 abandoned, leaving 1,220 pending.

There were 77 cases presented to the Department of Justice for prosecution on account of offenses against the pension laws, and indictments were found in 40 cases. There were 35 cases brought to trial during the year, in 34 of which convictions were secured—only 2 of these having been cases against persons who had rendered military or naval service. At the close of the year 116 cases were pending in the hands of United States attorneys. One civil suit was

instituted and 1 dismissed, and 4 were pending at the close of the year.

The sum of $3,448.04 was recovered through refundments.

As a matter of historical interest it is noted that the last surviving soldier of the Revolutionary War died April 5, 1869, and the last widow of a soldier of that war died November 11, 1906. The last surviving pensioned soldier of the War of 1812 died in 1905. There are now 238 widows of soldiers of that war on the roll.

APPEALS IN PENSION AND BOUNTY LAND CLAIMS.

On July 1, 1911, the Board of Pension Appeals, composed of eight lawyers and medical men, whose function it was to pass upon all cases brought to the Secretary's attention by appeal from the action of the Commissioner of Pensions, went out of existence and the work devolved upon the office of the Assistant Attorney General of the Department, under the provision of the act of Congress abolishing the board. That act provided for the appointment of two additional assistant attorneys and a medical expert. It was immediately found that three men could not handle the volume of work thus transferred to the office. It was necessary to appoint the remaining five of the former members of the board to other and subordinate positions in the Department and to detail them immediately to the office of the Assistant Attorney General for duty in connection with these appeals. The service required of them has been precisely that rendered when they were members of the former board, but the compensation is necessarily very much lower.

The abolition of the board was effected in the belief that the appeals in pension cases would be materially reduced. The event does not justify the expectation. The statistics concerning pension appeals are incorporated in the report herein as to the Assistant Attorney General's office. The fact that since the act of May 11, 1912, has been in operation the number of appeals has increased is mentioned in the estimates for appropriations for the work of the Department, and the Department has advised the reestablishment of the board.

Pension appeals are by no means confined to cases arising from service during the Civil War. A very large and increasing percentage relate to service during the War with Spain and in the regular establishment. In respect to the Civil War, the recent act (May 11, 1912), granting pensions not only on a basis of age but upon length of service has presented many new and difficult problems—questions of law, military and civil, as well as of fact.

On September 1, 1911, new rules governing appeals were put in operation. Appeals from that date have been filed in the Pension Bureau instead of in the office of the Secretary. The Commissioner

of Pensions is accorded 30 days in each appealed case to review his action, with the opportunity to recede therefrom. Since that date only those cases in which the commissioner insists that the merits warrant no reversal of his action have been transmitted to this office for final adjudication. One purpose has been effected—the number of merit appeals requiring the consideration of the pension-appeals section of the Assistant Attorney General's office has been materially reduced. About 18 per cent of the appeals filed have been disposed of in the Pension Bureau; between 3 and 4 per cent being dismissed for material defects, and the contentions of the appellants in 15 per cent being satisfied by the voluntary recession of the Commissioner of Pensions from his adverse action. The recorded number of appeals as given in the report of the Assistant Attorney General is therefore (by 18 per cent) less than the actual number of appeals; and of those appeals ultimately disposed of in my office the action of the commissioner was reversed in 8 per cent of the cases. The net result of noting an appeal, therefore, has been favorable to the pension claimant in about 23 per cent of the cases.

The report of the Assistant Attorney General shows to what an extent his office is overwhelmed with work, which has greatly increased over former years.

The law permits appeals in pension cases; and the figures hereinbefore quoted—the percentage of reversals and recessions—seem to justify the law. Some means of disposition of the appeals must continue to be provided either by men adequately compensated in the Assistant Attorney General's office, or, as prior to July 1, 1911, by a board. As the reason for abolishing the board has not been sustained by any material reduction in the number of appeals noted, I recommend that the Assistant Attorney General's office be relieved of this work and that the former Board of Pension Appeals be reestablished.

THE PATENT OFFICE.

During the fiscal year ended June 30, 1912, there were received 69,236 applications for mechanical patents, 1,775 applications for designs, 195 applications for reissues, 7,238 applications for trade-marks, 941 applications for labels, and 362 applications for prints. There were 35,539 patents granted, including reissues and designs, and 4,635 trade-marks, 625 labels, and 268 prints were registered. The number of patents that expired was 19,634. The number of allowed applications which were by operation of law forfeited for nonpayment of final fees was 6,970. The total receipts of the office were $2,094,059.50, the total expenditures were $2,019,236.01, and the net surplus of receipts over expenditures was $74,823.49. The grand total of net surplus receipts over all expenditures is now $7,138,749.25.

These statistics show a material increase during the last fiscal year over the fiscal year ended June 30, 1911. The total number of applications for patents for inventions, for designs, for reissue of patents, registration of trade-marks, registration of labels and registration of prints, disclaimer to patents, and appeals on the merits is 81,459. The total of all applications for the fiscal year immediately previous was 76,383 for the same period, which shows an increase of 5,076 applications received. The number of applications for mechanical patents shows an increase of 4,082 over the previous fiscal year, or 6.26 per cent, and an increase of 40.72 per cent for the 10 years since 1903.

I heartily concur in the recommendations of the commissioner regarding the need for a new building for the United States Patent Office. The rapid growth of the bureau since the erection of the present building has necessitated the utilization of every available foot of space within the building for the needs of the working force and the storage of valuable documents and records. The model halls and the corridors alike have been turned into working and storage quarters, the models having been removed to the basement of the House Office Building, where they are practically inaccessible to the Patent Office. It is important to note that the storage of records in the hallways, where they are exposed to dust and the ravages of time, and the constant exposure to destruction by fire, places in jeopardy documents of immense value to the commercial interests of the country. It also makes the building unsightly, and the inconvenience in having copies of patents, which are needed daily, scattered over the building is considerable. The clerks are occupying cramped quarters, although it has been repeatedly shown that this overcrowding is insanitary and not in accordance with the rules of hygiene, which prescribe a certain amount of cubic air space for each individual. I have, therefore, again to call attention to the suggestions of the commissioner embodied in his report that for the immediate future a suitable building be leased for occupation by the Patent Office pending the construction of a permanent Patent Office building, so that the present building may be thoroughly renovated and remodeled for the use of the Department and those of its bureaus that are now in rented quarters. This would result in an economy of time and money and would greatly relieve the present situation, which is extremely unsatisfactory.

The commissioner recommends the introduction of a bill in the forthcoming session of Congress similar to a bill introduced in April of 1909 by the late Senator Daniel, of Virginia, which contemplated the condemnation and purchase of sufficient land opposite the Capitol and north of the Library of Congress upon which to erect the new Patent Office Building, and calls attention to the fact that the Patent

Office has heretofore earned the money that might be appropriated for that purpose.

The commisioner has recommended that legislation be enacted for the protection of collective trade-marks, in order to fulfill the terms of section 7½ of the international convention for the protection of industrial property, signed at Washington, June 2, 1911, which convention has been approved by the United States Senate and will become effective on April 1, 1913. Under your direction the commissioner prepared a measure, which was recommended in your message to Congress under date of February 2, 1912. This measure, the draft of which conforms substantially in terms to the provisions of law upon this subject found in the British trade-mark act of 1905, does not appear to have been taken up for consideration by the Congress, and it is suggested that the attention of Congress be directed to the urgent need for this legislation.

BUREAU OF EDUCATION.

The Commissioner of Education during the year established two new divisions, to have charge of matters relating, respectively, to rural education and to school hygiene and sanitation, and was thereby enabled to extend very largely the field service of the bureau. Aid has been given to school boards and officers in many parts of the country in the location, planning, and construction of school buildings of all kinds, and a large amount of data regarding the health of school children has been compiled and furnished to inquirers.

The problems of rural education, which are very difficult and very important to our national life, are studied as fully as the limited means of the bureau will permit. Special collaborators in all sections of the country have been appointed at nominal salaries and are keeping the bureau informed as to the pressing problems and forward movements in rural education in their several communities. Several bulletins on this phase of education were issued during the year and have received wide circulation.

Forty of the colleges of agriculture and mechanic arts endowed by the Federal Government were visited during the year by a representative of the bureau, who made an inspection of the finances, organization, and administration of the institutions. Irregularities in the application of the Federal grants were discovered in several instances and steps taken for remedying them promptly. Each State and Territory now receives an annual appropriation of $50,000 from the Federal Government for such institutions, and the total amount paid out by the Government for the institutions since 1890 is $31,302,000.

At the request of the Department of Public Instruction of the State of Oregon, the colleges and universities in that State were ex-

amined by the bureau, and at the request of the Virginia Education Commission an examination was made of the institutions for higher education receiving aid from the State. In both cases detailed reports of the examinations were furnished to the States.

The furnishing of information to State and other education officers respecting educational legislation in all the States was continued during the year. The service of the bureau was largely extended by the issuance to the public through the educational and public press of information respecting important movements in education throughout the United States and in foreign countries.

There were issued during the year 32 numbers of the Bulletin of the Bureau of Education, for some of which the demand was very great. The limitation of 12,500 copies of any bulletin that may be issued by the bureau should, in my opinion, be removed.

In my report for 1911 (pp. 48–51) I called attention to the fact that certain pressing needs of the bureau must be supplied before it can begin to do in an effective way even the most important and obvious of the things for which it was established. While the population of the country has more than doubled since the bureau was established, the expenditures for education have increased sixfold, and the complexity of the problems of education have increased many fold. With a like increase in the demands made upon the Bureau of Education, the annual appropriations made for its support have increased from year to year only slightly or not at all. The excess of the estimates for its support over the amount appropriated for the current year may appear large, but it should be remembered that it is only a part of the sum of moderate increases that ought to have been made annually for the past 30 years. The commissioner recommends that provision be made for the following:

1. An Assistant Commissioner of Education, who should be a specialist in secondary education and serve as chief of the division of high schools. To keep in close touch with the work of education in all parts of the country, as he must if he is to do his work effectively and make the bureau the vital factor it should be in the educational life of the country, the commissioner must travel much. When in the office he should be relieved from minor details that he may have time for the larger and more important work of direction.

2. Additional specialists in rural education and in school hygiene and sanitation. The work this bureau should do in these subjects is much larger than can be done with its present staff and with the appropriations now made for these purposes.

3. A group of specialists and assistants in industrial and vocational education.

4. Additional specialists and assistants in higher education.

5. Specialists and assistants in the administration of city schools.

6. A specialist in the history, theory, and practice of education, who shall serve as a director of investigations, give assistance to other specialists in the bureau and to students of education, committees, and commissions who apply to the bureau for help in their investigations.

7. Cooperative experiments in elementary and secondary education under varying conditions in different parts of the country, the results of these investigations to be published for the information of the public.

8. Additional clerks to carry on the present routine work of the office and such additional work of this kind as may become necessary because of the larger work planned.

9. Traveling expenses sufficient to enable the commissioner and the specialists in the bureau to do their work effectively. The nature of the work of the bureau requires that the commissioner and the specialists in the bureau should travel in all parts of the country.

The commissioner also recommends that the limitations placed by section 3 of the act of Congress approved August 23, 1912, making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June 30, 1913 (37 Stat., 413), and by section 7 of the act of Congress approved August 26, 1912, making appropriations to supply deficiencies in appropriations (37 Stat., 626) on the amount of salaries that may be paid from lump-sum appropriations be removed so that the services of competent men and women may be obtained. The salaries in the Bureau of Education have always been low, and that bureau, he states, can never do effectively the most important work for which it was created until it can retain in its service men and women of learning, experience, working capacity, and expert knowledge such as will win for their opinions and utterances the respect of leaders in all lines of educational activity. Men and women of this character can not be retained at the salaries now paid.

The number of public schools for natives of Alaska that were maintained during the year was 86, with an enrollment of 4,018 and an average daily attendance of 1,805. The field force of the Alaska school service consisted of 5 superintendents, 110 teachers, 7 physicians, 7 nurses, 2 contract physicians, and 2 hospital attendants.

Of the appropriation for education in Alaska, $24,926.04 was expended for the medical relief of natives. In order that the entire medical work among the natives of Alaska might have expert supervision, upon the request of this Department Passed Asst. Surg. Emil Krulish, of the Public Health Service, was detailed for duty in Alaska under the direction of the Commissioner of Education.

Adequate provision for the medical relief of the natives of Alaska is an urgent national duty, and liberal appropriations therefor should be made. The use of part of the appropriation for "Educa-

tion of natives of Alaska" for the suppression of disease among the natives is an emergency measure. All of the appropriation and more is needed for the work of education. That results in education commensurate with expenditures may be obtained, there should be a law compelling the parents and guardians of native children to send their children to school regularly unless they are excused for good reasons.

The reindeer in Alaska, according to latest reports, numbered 33,629, of which 60 per cent are owned by 460 natives, while the Government owns only 11 per cent. In October, 1911, there were shipped from Nome to Seattle 125 reindeer carcasses purchased by a cold-storage company from Eskimo herders. This shipment of approximately 18,750 pounds found a ready sale in Seattle, and marked the beginning of the exportation of reindeer meat from Alaska.

By Executive order a tract of land approximately 12 square miles has been reserved on the west shore of Prince of Wales Island for the Hydah Tribe, formerly living in the villages of Klinquan and Howkan. They have established a village and named it Hydaburg, have organized a trading company for the transaction of mercantile business, and a lumber company. With assistance rendered by the bureau, a sawmill has been installed and the members of the tribe are given instruction in its operation. According to reports received the colony is in a flourishing condition.

TERRITORIES.

Since the transfer under Executive order of July 15, 1909, of the supervision of affairs in Porto Rico to the Insular Bureau of the War Department, the former Territories of New Mexico and Arizona have been admitted as States, and there now remains under this Department the supervision of but two Territories, Alaska and Hawaii.

ALASKA.

During the past year there was probably a small increase in the number of residents in Alaska engaged in industries of a permanent character, but there was apparently a considerable decrease in the population of Alaska as a whole. The gain in white population, excluding Russians and native people, between the census years 1900 and 1910 was 5,854, or 19 per cent. The native population has probably remained stationary in number since 1910, when the total number of people in the Territory, both white, native and mixed, was 64,356. The moderate decline in white population which has been experienced in the last two years is due in part to diminished activity in placer mining in the interior valleys, probably in at least an equal

measure to inadequate laws, and the consequent withdrawal of much of the public lands and natural resources from development.

Some encouragement has been derived, however, from the recent legislation authorizing an examination and report by a board of experts on feasible railroad routes from tidewater to the interior, from the favorable action of the Senate Committee on Public Lands on a coal-lease bill, and from the law providing a local legislature. The investigation authorized in relation to feasible railroad routes is regarded as of the highest importance, since cheap transportation is a prime factor in early territorial development. The local legislative body, however, provided by the act of August 24, 1912, has but restricted powers and can not be expected to solve the main problems of Alaska. These must necessarily be dealt with by Congress alone.

ASSESSED VALUATION AND TAXES.

There are now 16 incorporated towns in the Territory, one of which was added during the year. The assessed valuation of property in nine of these incorporated towns is stated to be approximately $8,880,859, and the tax rate of eight of these towns is stated as ranging from one-half of 1 per cent to 2 per cent. The amount of taxable property in incorporated towns is relatively small and appears to be increasing very slowly.

COMMERCE.

The merchandise shipments, including precious metals and copper, increased materially, the total commerce between Alaska and the United States and between the Territory and foreign countries aggregating $62,680,507. The merchandise shipments to Alaska from the States aggregated in value $18,809,270, as against $15,736,510 for 1911, and against $17,811,093 in the heretofore banner year of 1907. There was a large increase in the shipments of material required in connection with the canning of fish, which industry has greatly expanded. Dredging machinery to considerable value was also shipped into the Territory. The total shipments, including copper but not precious metals, from Alaska to the States were valued at $20,776,756, being an increase of nearly $7,000,000 over 1911, when the total was $13,813,824. Of the large increase, more than $4,000,000 was in copper ore and nearly $3,000,000 in canned salmon. There was a decrease in the coal shipments during the year, probably due to the increase in the use of fuel oil by several large consumers in the Territory.

MINES AND MINING.

The most notable events in the mining industry during the last year have been the increase in the output of copper ore in the Chitina

and Prince William Sound regions and in the preparations for a very large gold quartz development in the Juneau district.

The mineral output in 1911 is estimated at $20,650,000, of which $16,104,310 was of gold and silver. On account of a large increase in the output of copper in the last calendar year, there was a gain in mineral production as a whole, although there was a slight falling off in the gold output, this loss amounting to $883,680.

FISHERIES.

Attention is called to the great importance of the marine wealth of Alaska and the vital need of supplementary legislation to protect and develop the fishing industry. A review of the recently completed detailed statistics for 1911 shows that there were 17,932 persons engaged in all branches of the fisheries of Alaska during that calendar year, an increase of 2,312 over the number of persons so engaged in 1910. It is gratifying to note additional increases in the number of natives of Alaska employed.

The total investment in all branches of the fisheries in 1911, exclusive of that in the vessel fisheries for offshore cod and halibut, was $22,617,387. Of this amount, $19,931,215 was invested in the salmon-canning business and $623,126 in salting and mild curing salmon, $1,194,073 in the halibut fishery, $295,220 in the herring fishery, and $215,670 in the central Alaska cod fishery.

At present there are five private and two Government hatcheries in operation. The governor recommends that the rebate system as applied to operators of private hatcheries be abolished and that such establishments be taken over at fair valuation by the Federal Government, thereafter to be operated by the Bureau of Fisheries. A discussion of the rebating system or remission of taxes appears in the 1911 report of the Alaska Fisheries and Fur Industries, which document is issued by the Bureau of Fisheries. The following is quoted on this subject:

> The principle of encouraging the operation of private hatcheries by remitting taxes on the commercial output of the fisheries is subject to criticism on the ground that the remission is discriminatory in that it favors the fishing industry solely, whereas the tax on other industries is of general benefit, and therefore is in true sense a tax for revenue.

The governor calls attention to the need of more hatcheries, and suggests that five new hatcheries be provided on the following waters or tributaries thereof: Bristol Bay, two; and Chignik Bay, Icy Straits, and Lynn Canal, one each.

Some of the fishing interests, it appears, have urged that the tax moneys now levied upon and collected from the salmon-packing industry should be directly applied to the construction and mainte-

nance of hatcheries, instead of being covered into the "Alaska fund" under the provisions of the act of January 27, 1905, and then disbursed, as at present, for the maintenance of schools and the construction of wagon roads outside of incorporated towns. This proposition should not be favorably considered. The soundest reasons argue against it. Disregarding the doubtful policy of extending the occasional practice of applying certain tax moneys to exclusive purposes, it should be necessary only to say that if the Alaska salmon taxes should be diverted from the "Alaska fund," where they serve two chief objects of a permanent and indispensable character, it would probably become impossible to maintain the school system without special appropriations. It would certainly be impossible to build more wagon roads from the moneys of this fund, and it might become difficult fully to maintain the present roads, of which there is a large mileage.

In order that the fishing industry of Alaska in its present enormous proportions may receive adequate supervision, Congress should make provision for several additional government agents, and for at least two more boats for their use.

I concur in the recommendation of the governor that legislation be enacted prohibiting the use of herring or other food fishes for the manufacture of fertilizer or oil, after an equitable period within which present concerns may close up their business.

AGRICULTURE.

During the fiscal year the work of the Alaska experiment stations has been highly successful. As a result of an unusually long summer in 1911, vegetables, particularly potatoes, matured well, except at interior points, where growth was prevented by a killing frost which occurred August 31.

Grain breeding at the Rampart station promises success, and tests are being made of the several hybrid varieties of barley already developed. Oats, although early in maturing, are not found to be heavy yielders. Kharkov winter wheat was badly winter killed, the snowfall not being heavy enough to protect it, but winter rye, which is hardier than winter wheat, gives promise of a good crop, and is of more importance in all northern latitudes where grain is grown.

At the Sitka station the hybrids obtained by the crossing of several cultivated varieties of strawberry with the wild strawberry of the Alaska coast are more successful than ever before.

Work at the Kodiak station in the breeding of cattle and sheep has met with signal success, but the grazing in the part of Kodiak Island where the station is situated was damaged by a heavy fall of volcanic ashes last summer.

COAL LANDS.

The conditions surrounding the coal-bearing areas of Alaska have not changed essentially since last year, except that the distressing need of cheap native fuel for the development of the Territory's other resources has been even more strongly emphasized by the prolonged period of congressional inaction. The governor reports that the residents of the Territory generally are willing to accept any measure which will cause the fuel resources to be opened to development—so much so that the comparative advantages of a fee system, a leasing plan, or government operation have almost ceased to be a matter of discussion.

The importation of coal from the coast States and from British Columbia has declined to a considerable degree, probably because of the installation of oil-burning apparatus by several of the larger consumers who are situated near tidewater. Fuel oil is being used at Cordova, only a few miles from the dormant Bering River coal beds, at a cost equivalent to about $8 per ton for bituminous coal.

The importations of coal into Alaska from the States and from foreign countries amounted to 71,452 tons, valued at $365,557, as against 109,450 tons, valued at $558,123, in the year 1911. These figures, however, do not include coal from foreign countries via the United States, the amount of which in 1911 was 6,447 tons, valued at $56,580. In addition to the above, there were shipments of 336 tons of coke in 1911 and of 100 tons in 1912.

The open-market prices at which bituminous coal was sold at several of the towns on the seacoast of Alaska, including the charge for delivery to the premises of the consumer, were as follows: For long-ton weights, except at Juneau and Skagway: Juneau, $10; Ketchikan, $11.50; Skagway, $13; Wrangell, $14; Cordova, $17.50; Unalaska, $15; Nome, $21.30.

NATIVE INHABITANTS.

The condition of the Indians in the southeastern part of the territory, and to some extent in other sections, has been beneficially affected by the vigorous prosecution of whisky peddlers and "bootleggers" during the last year. The natives generally of Alaska are self-reliant, and many of them engage in profitable business, especially in the commercial fisheries, and to some extent in the mines of southeastern Alaska. The natives of the Copper River Valley and the Aleutian Islands are poorer than those of other parts of the Territory, but extreme poverty is not prevalent, although many natives suffer from sickness every year and many others are afflicted with chronic diseases. Increased funds are needed for the education of the natives and for the furtherance of plans for sanitation and medical treatment among the Indians, Aleuts, and Eskimos.

The governor states that he does not favor any project looking to the placing of Alaska natives on reservations, since that would almost surely tend, under any system likely to be devised, to impair the self-reliant spirit for which these people generally are noted.

ROADS AND TRAILS.

The importance of wagon roads and trails to the development of the Territory is similar if not actually commensurate with that of railroads. The valuable work carried on by the board of road commissioners for Alaska has illustrated this fact for several years. Productive industries and commerce to the amount of millions of dollars are dependent upon the wagon roads already constructed, and I urge that increased appropriations for this work be authorized.

AIDS TO NAVIGATION.

A greater number of lights and other aids to navigation have been installed each year for the last three years in Alaska waters than had been installed in the entire history of the Territory prior to 1910. The general importance of such aids in northern waters is self-evident, when it is considered that the number of vessels plying between Alaska and ports outside of the Territory is larger than ever before, and the transportation of passengers to and fro reaches larger proportions than the extent of the population would indicate. Whether due to the greater safety of navigation or not, freight carrying charges between the ports of southeastern Alaska and those of Puget Sound have been reduced by approximately 50 per cent within the last two years. In any event the installation of lights and buoys is to be regarded as a matter of great economic as well as humane importance, calculated to reduce the cost of ocean transportation, and hence promote the development of the Territory's resources.

TERRITORIAL LEGISLATURE.

Pursuant to the act of Congress approved August 24, 1912, entitled "An act to create a legislative assembly in the Territory of Alaska, to confer legislative powers thereon, and for other purposes," an election was held in the Territory in November of 1912 for members of the legislature, and the assembly will hold its first session beginning in March, 1913.

PUBLIC BUILDINGS.

The governor calls attention to the fact that the work on the general office building, intended to provide quarters for the post office, customhouse, governor's office, surveyor general's office, and several other important offices of the Government in Juneau, which

was authorized by the act of 1910, has not been commenced, although an excellent site has been acquired at a fairly reasonable price. He states that the limit of cost of $200,000 for the building and site was not large enough at the time it was authorized, but since that time a Territorial legislature has been provided for and the first legislature will be obliged to rent quarters for its use. In order to provide a suitable capitol building, with accommodations for the legislative assembly and all the various government offices located at Juneau, the limit of cost referred to should be increased to at least $500,000.

GOVERNOR'S OFFICE.

The appropriation for clerk hire in the governor's office is limited to $2,250 per annum, which is large enough for the employment of only one first-class clerk or private secretary. The present secretary, it is stated, has been doing double work for the last year and a half, as the business of the office has increased several fold since 1909, and even since 1910. Under the terms of the act of Congress creating the Territorial legislature several specific duties, such as the disbursement of all funds for the legislature, have been imposed upon his office. It will be absolutely impossible for one clerk to do the work; and the request submitted in the annual estimates for an additional allowance of $1,800 for clerk hire should, therefore, be granted.

HAWAII.

During the past summer, in the performance of official duty, I had occasion to visit the Territory of Hawaii and to conduct an investigation into the economic conditions existing there, especially as these conditions affect the disposition and development of the public lands, and the character and conduct of the transportation facilities, upon which the development of these lands largely depend. A series of daily public hearings extending over nearly four weeks was stenographically reported, but the transcript has not yet been received at the office of the Department. If practicable after its receipt it is my intention to comment further upon this investigation in a future report to you. In any event the record of the inquiry will be filed in the Department, and contains much information which should be of value in the future administration of the affairs of the Territory.

The governor in his annual report states that the year has been the most prosperous in the history of the Territory.

Imports and exports aggregated $84,143,760, an increase of $14,692,597. The imports were $28,694,322, an increase of $1,181,742, and the exports $55,449,438, an increase of $13,510,855. About nine-tenths of the trade is with the United States and about nineteen-

twentieths of the freight is carried in American vessels. The customs receipts were $1,643,197.37, a decrease of $11,563.97. The internal-revenue receipts were $226,225.42, an increase of $47,486.28.

Territorial receipts greatly exceeded expenditures, the net cash balances in all revenue accounts at the close of the year showing an increase of $232,735.71. The total revenues collected by the Territory and counties aggregated $4,315,972.76, an increase of $556,136.36, of which $2,560,505.88 went to the Territory and $1,755,466.88 to the counties. Out of $3,641,556.60 available to the Territory out of current revenues, including cash on hand, $2,327,770.17 was expended.

Territorial 4 per cent bonds were paid to the amount of $50,000, and additional public improvement 4 per cent bonds were issued to the amount of $1,500,000 at 101.583, and since the close of the year additional bonds have been issued to the same amount at 100.588. At the close of the year the bonded indebtedness was $5,454,000, or 3.08 per cent of the assessed value of property. A portion of this indebtedness was incurred for county improvements. There are no county bonds.

A new tax system was inaugurated, placing the Territory and each county on an independent and elastic financial basis. The assessed value of property increased from $154,584,032 to $176,834,801.

Bank deposits at the close of the year aggregated $18,189,135.50, an increase of $2,878,871.99. The capitalization of domestic corporations was $168,217,578 at the close of the year, an increase of $11,344,550. New fire, life, and marine insurance was written to the amount of $96,213,859.42.

The population in 1910 was 191,909. This census was commented upon in the annual reports for 1910 and 1911. It may be of interest, however, to repeat that the population by races is as follows: Hawaiians, 26,041, a decrease of 3,746 between 1900 and 1910; Part-Hawaiians, 12,506, an increase of 4,658 (of these 8,772 are Caucasian-Hawaiians and 3,734 Asiatic-Hawaiians); Portuguese, 22,303, an increase of 6,628; Spanish, 1,990; and Porto Ricans, 4,890 (both new); other Caucasians, 14,867, an increase of 4,290; Chinese, 21,674, a decrease of 4,088; Japanese, 79,674, an increase of 18,559; and all others (including 4,533 Koreans, 158 blacks, 537 mulattoes, and 2,736 others), 7,964, an increase of 4,727.

During the last two years the births in the Territory numbered 9,641 and the deaths 6,397, of which 5,147 births and 3,071 deaths occurred during the past year. In unassisted immigration there has been an increase of Americans and a decrease of Japanese. Owing to a constant excess of arrivals over departures of Japanese women, there is an increasing number of Japanese births in the Territory. Assisted immigration has been chiefly of Europeans—that is, Portuguese, Spanish, and Russians—by the Territorial government

and of Filipinos by the Hawaiian Sugar Planters' Association. Of the former 3,513 and of the latter 3,013 were introduced during the year. During the last five and a half years the Territory has introduced 5,288 Spanish, 4,962 Portuguese, and 2,056 Russians, a total of 12,306, at a cost of about $900,000, and during the last three years the sugar planters have introduced 7,973 Filipinos. The percentage of non-Asiatic laborers on the sugar plantations has increased to 31.28. Wages are reported to have materially increased during the year.

During the year 483 homesteads, or more than twice as many as for any preceding year, were taken, notwithstanding the more stringent provisions of the amendments of the organic act to secure genuine homesteading. The percentage of homesteads taken by Americans and other Caucasians has been larger than usual. A marketing bureau and additional demonstration farms have been established and some progress has been made toward putting homesteading on a more satisfactory basis in other ways. The topographic survey has made rapid progress on the island of Hawaii after completing the island of Kauai, and the hydrographic survey has been greatly extended on all the principal islands. Steps have been taken for the construction of several large irrigation ditches. The proceeds of sales and leases of public lands should be made available for the construction of homestead roads as well as for surveying and opening homesteads.

Transportation facilities have improved. Ten large ocean steamers are under construction, and one new steamer was added for the inter-island traffic. Dredging and breakwater construction has progressed in several harbors, and contracts have been let for many new wharves. There has been considerable railroad construction. Wireless communication was established with the Pacific coast and arrangements are being made for establishing it with Japan. Appropriations should be made by Congress for continuing work on the harbors at Honolulu, Hilo, and Kahului and beginning work on the harbor of Nawiliwili.

The year has been especially marked by the construction of public works, mainly roads, water and sewer works, wharves and harbors, public school buildings and other public buildings, for which about $4,000,000 are available for the present biennial period.

The year has been the most important in the school history of the Territory. A new and largely automatic arrangement was established for financing the schools, which has increased the amount available for schools about 30 per cent, resulting in a great increase in the number of teachers and pupils, and also in the average teaching efficiency through the payment of higher salaries. Many new school buildings were constructed. At the close of the year there were 29,909 pupils in the schools, of whom 23,752 were in the public schools.

More than usual attention was given to the public health, which is one of the largest subjects with which the Territorial government has to do. The more important special features of the year were a vigorous mosquito campaign in Honolulu, following the first and only case of yellow fever that has occurred in the Territory, and a rat campaign in the districts of Hilo and Hamakua on the island of Hawaii, in consequence of plague having become endemic in those districts.

The Federal military forces have been increased. Work has proceeded rapidly on the Pearl Harbor Naval Station, the dredging of the harbor channel was completed, and the flagship *California* of the Pacific Fleet entered the harbor to the naval station. The flagship of the second division of that fleet visited Palmyra Island for the purpose of confirming the title of the United States to it as a part of the Territory of Hawaii.

NATIONAL PARKS AND RESERVATIONS.

By the act of Congress approved March 1, 1872, establishing the Yellowstone National Park, Congress inaugurated the policy of setting aside land as recreation grounds for all the people. Since that time additional lands in various sections of the country have been set aside for such purposes, as well as for the preservation of the wonders of nature therein from desecration and for the protection of the flora and fauna. These national parks, now aggregating 12 in number, embrace over 4,500,000 acres of land, and there should be speedily added thereto the Grand Canyon of the Colorado River with its wonderful scenic features, for the creation of which as a national park recommendations have been submitted to Congress.

The areas of these parks, with date of establishment of each, are as follows:

Areas of national parks.

Name.	Date of establishment.	Acres.
Yellowstone, in Wyoming, Montana, and Idaho	Mar. 1, 1872	2,142,720.00
Yosemite, in California	Oct. 1, 1890	719,622.00
Sequoia, in California	Sept. 25, 1890	161,597.00
General Grant, in California	Oct. 1, 1890	2,536.00
Mount Rainier, in Washington	Mar. 2, 1899	207,360.00
Crater Lake, in Oregon	May 22, 1902	159,360.00
Wind Cave, in South Dakota	Jan. 9, 1903	10,522.00
Sullys Hill, in North Dakota	Apr. 27, 1904	780.00
Platt, in Oklahoma	July 1, 1902 / Apr. 21, 1904	848.22
Mesa Verde, in Colorado	June 29, 1906	42,376.00
Five-mile strip for protection of ruins	....do....	175,360.00
Hot Springs Reservation, in Arkansas	June 16, 1880	911.63
Glacier, in Montana	May 11, 1910	981,681.00
Total		4,606,153.85

The constantly increasing number of persons, not only from this country but from abroad, who visit these national parks as a means

of recreation and to view the wonders therein clearly indicates the great interest taken by the public in these parks. The total number of visitors to all the parks during the past year aggregated approximately 229,084, as against 224,000 in 1911 and 198,506 in 1910. Future travel to these reservations will doubtless be greatly augmented, particularly during 1915, when the Panama-Pacific International Exposition will be held in San Francisco.

The economic value of tourist traffic to these reservations is evidenced by the financial reports of concessionaires in two of the largest parks, to wit: In Yellowstone, where the gross receipts in 1911 aggregated $1,050,039, and in Yosemite, for the same year, where it aggregated approximately $295,500. In my last annual report I called attention to the fact that the superintendents of the various parks were brought together at a conference held under my direction in the Yellowstone National Park in September, 1911, for the purpose of discussing the many difficult problems presented in the administration of affairs of each reservation, with very satisfactory results. In October of the present year a second conference of the various park superintendents was held under my direction in Yosemite National Park, at which there were in attendance the chief clerk and other representatives of this Department, representatives of the Departments of Agriculture and War, of various transcontinental railroads, and of many concessionaires in the parks, as well as a large number of persons interested in national-park matters. Various phases of park administration were discussed, including camp and hotel accommodations, sanitation, transportation, construction of roads, trails, and bridges, forestry, fire protection, protection of game, and the use of motor-driven vehicles on the roads, etc. The information acquired as a result of the consideration of the various matters presented will doubtless result in more effective administration in many respects. The consensus of opinion, however, at this conference, as well as of that of 1911, was that the development of the national parks should proceed along more liberal lines than heretofore, and that the supervision of activities therein be centralized in a bureau especially charged with such work, and a measure looking to this end is now pending in Congress.

The laws relating to all the parks, excepting the Yellowstone National Park, should be amended so as to authorize the Secretary of the Interior to grant leases for periods of 20 years or less, with provisions for renewal or for payment for the lessee's appropriate improvements at the end of the lease. The present limitation of 10 years in most of the reservations is not such as to induce capital to make investments in buildings and hotels, etc.

It is of special and urgent importance that provision should also be made by Congress for the extinguishment of private holdings in

the several parks. These holdings seriously interfere with the proper administration of the parks and impair their usefulness and beauty in many ways. They can be extinguished either by way of direct appropriation for their purchase, or by authorizing their exchange for lands or timber within the particular parks or within the national forest reserve adjacent thereto. The public timber so exchanged can, in many cases, be confined to dead or matured timber which can be removed from the parks without injuriously affecting the scenic beauty thereof. If authority of this sort is vested in the Secretary of Agriculture and the Secretary of the Interior, as to the reserves of which they have jurisdiction respectively, exchanges of park or forest lands or timber can be made for appropriate strips of private timbered lands along the public roads within the exterior limits of the parks or forest reserves, so as to protect the scenic beauty of these roads from impending destruction.

NATIONAL MONUMENTS AND PRESERVATION OF AMERICAN ANTIQUITIES.

By an act approved June 8, 1906, entitled "An act for the preservation of American antiquities," the President of the United States is authorized, "in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments." Under such authority the President has created the following monuments:

National monuments administered by Interior Department.

Name.	State.	Date.	Area.
			Acres.
Devils Tower	Wyoming	Sept. 24, 1906	1,152
Montezuma Castle	Arizona	Dec. 8, 1906	160
El Morro	New Mexico	do	160
Chaco Canyon	do	Mar. 11, 1907	[1] 20,629
Muir Woods [2]	California	Jan. 9, 1908	295
Pinnacles	do	Jan. 16, 1908	2,080
Tumacacori	Arizona	Sept. 15, 1908	10
Mukuntuweap	Utah	July 31, 1909	[1] 15,840
Shoshone Cavern	Wyoming	Sept. 21, 1909	210
Natural bridges [3]	Utah	Sept. 25, 1909	[1] 2,740
Gran Quivira	New Mexico	Nov. 1, 1909	[1] 160
Sitka	Alaska	Mar. 23, 1910	[1] 57
Rainbow Bridge [4]	Utah	May 30, 1910	160
Lewis and Clark Cavern	Montana	May 16, 1911	160
Colorado	Colorado	May 24, 1911	13,883
Petrified forest	Arizona	July 31, 1911	25,625
Navajo [5]	do	Mar. 14, 1912	[5] 360

[1] Estimated area.
[2] Donated to the United States.
[3] Originally set aside by proclamation of Apr. 16, 1908, and contained only 120 acres.
[4] Within an Indian reservation.
[5] Based on 15 known ruins with a reserved area of 40 acres surrounding each ruin. Exterior limits of tract specified in proclamation contain 918,310 acres.

The Navajo National Monument as originally created by proclamation of March 20, 1909, embraced approximately 600 acres within the Navajo Indian Reservation, which was reserved tentatively and with a view to reduction to such small tract or tracts as might thereafter be found to contain valuable prehistoric pueblo or cliff dwellings, when the extent of the same could be determined by an examination on the ground and their locus definitely fixed by traverse lines connecting them with some corner of the public survey. Both of these conditions having been fulfilled, the monument was reduced by proclamation dated March 14, 1912, to three small tracts aggregating 360 acres. Within two of these tracts are located, respectively, two interesting and extensive pueblo or cliff-dwelling ruins in a good state of preservation and known as "Betata Kin" and "Keet Seel," and a third cliff-dwelling ruin called "Inscription House," located on Navajo Creek. "Inscription House" is regarded as extraordinary, not only because of its good state of preservation but because of the fact that upon the walls of its rooms were found inscriptions written in Spanish by early explorers and plainly dated 1661.

The Mount Olympus (Washington) National Monument was set aside by proclamation dated March 2, 1909, and contains approximately 608,640 acres. It was reduced by proclamation dated April 17, 1912, to 608,480 acres, in order to permit certain claimants to land therein to secure title to the land.

The supervision of these various monuments has, in the absence of any specific appropriation for their protection and improvement, necessarily been intrusted to the field officers of the Department having charge of the territory in which the several monuments are located. This supervision in many instances is necessarily limited, and considerable difficulty has been experienced in protecting the monuments from vandalism, unauthorized exploration, and spoliation. An estimate for an appropriation of $5,000 has been submitted to Congress for the protection and improvement of these reservations. Only such monuments as in the judgment of the Secretary of the Interior are subject to depredations by vandals and unauthorized collectors should be provided with a custodian or superintendent and then only when such danger really exists. In this way a small general appropriation can be made available and adequate for the whole field.

The following national monuments are not administered by the Secretary of the Interior. Those that should be continued should be placed under the proposed bureau of national parks.

National monuments administered by Department of Agriculture.

Name.	State.	Date.	Area.
			Acres.
Cinder Cone	California	May 6, 1907	[1] 5,120
Lassen Peak	do	do	1,280
Gila Cliff Dwellings	New Mexico	Nov. 16, 1907	160
Tonto	Arizona	Dec. 19, 1907	[1] 640
Grand Canyon	do	Jan. 11, 1908	[1] 806,400
Jewel Cave	South Dakota	Feb. 7, 1908	[1] 1,280
Wheeler	Colorado	Dec. 7, 1908	[1] 300
Oregon Caves	Oregon	July 12, 1909	480
Devils Postpile	California	July 6, 1911	[1] 800
Mount Olympus	Washington	Apr. 17, 1912	[1] 608,480

[1] Estimated area.

National monument administered by War Department.

Name.	State.	Date.	Area.
			Acres.
Big Hole Battlefield	Montana	[1] June 23, 1910	5

[1] Set aside by Executive order.

ELEEMOSYNARY INSTITUTIONS.

GOVERNMENT HOSPITAL FOR THE INSANE.

On June 30, 1912, there were remaining in the hospital 2,898 patients as against 2,862 remaining on June 30, 1911, an increase of 36 over the previous year. There were admitted during the year 733 patients, an increase of 110 over the previous year. The total number of patients treated during the year was 3,595, an increase of 56 over the previous year. The number of discharges during the year, including deaths, was 697, an increase of 20 over the previous year. The daily average number of patients was 2,871.75 as against 2,884 for the previous year, a decrease of 12.15.

The training school for nurses graduated 7 male and 10 female nurses.

When we note that the number of admissions for the year amounts to 733, having been exceeded only upon two previous occasions, namely, in 1902–3, when the admissions were only 734, and in 1903–4, when there were 766, the years following closely upon the Spanish-American War and the occupation of the Philippines, it will be seen that a considerably more rapid increase in the number of patients of the hospital is to be expected from now on.

Patients during fiscal year ended June 30, 1912.

	Male.		Female.		Total.
	White.	Colored.	White.	Colored.	
Remaining June 30, 1911	1,733	383	478	268	2,862
Admitted during the year	455	88	110	80	733
Total number under treatment	2,188	471	588	348	3,595
Discharged:					
Recovered	92	14	21	19	146
Improved	25	8	10	9	52
Unimproved	65	7	22	8	102
Not insane	45	9	6	5	65
Died	199	59	43	31	332
Total	426	97	102	72	697
Remaining June 30, 1912	1,762	374	486	276	2,898

During the year a committee of six, consisting of Surg. Gen. George H. Torney, United States Army, representing the Secretary of War; Surg. A. W. Dunbar, representing the Secretary of the Navy; Mr. Robert V. La Dow, superintendent of prisons, representing the Attorney General; Maj. William V. Judson, Corps of Engineers, United States Army, representing the Commissioners of the District of Columbia; Mr. Scott C. Bone, representing the Board of Visitors of the Government Hospital for the Insane; and Dr. William A. White, superintendent of the Government Hospital for the Insane, representing the Secretary of the Interior, appointed by the Secretary of the Interior, after consultation with the President, went into a full investigation of the needs of the hospital and the future policy for its growth and development. The result of their deliberations was printed in the form of a report, transmitted to the Secretary of the Interior, and which was later transmitted by you to Congress (S. Doc. 256, 62d Cong., 2d sess.). This report discusses very fully the need of the hospital under four heads: (*a*) Defects in the laws governing the conduct of the institution and the commitment of patients. Under this head a draft of proposed legislation is included for commitment from the District of Columbia, along with certain changes in the legislation with reference to the transfer of Federal prisoners to the hospital. (*b*) The advisability of continuing in the hospital patients committed from the District of Columbia and from the Army and Navy and from distant points. Under this head is discussed the whole question of the future policy of the hospital with reference to the commitment of patients from distant points. (*c*) The policy to be adopted relating to the growth of the institution, and the matter of additional lands, buildings, equipment, etc. Here the questions of administration, size of the institution, and its physical needs are discussed, together with a special report as to the care of the criminal insane.

(*d*) The present conduct of the institution, including recommendations for improvement of the service and the advancement of the interests of the inmates. Under the third section the needs of the hospital are set forth. This report should be acted upon by Congress.

The guards on the Howard Hall Building for insane convicts have all been strengthened, and additional tool-proof guards have been installed. The doors have been reenforced and iron plates put over the face of the locks. This building has now been put in as safe condition as it can be without further appropriation from Congress.

The President's Commission on Economy and Efficiency has made an investigation and preliminary report of the work of the hospital.

The general health at the institution has, on the whole, been good throughout. Two cases of typhoid fever developed among the employees of the hospital, both of which were traceable to outside infection. There have been a number of cases of malaria, which, however, were due to the stagnant water resulting from the filling in of the river flats. Efforts have been made to minimize this by more extensive screening of the buildings.

Thirty-two original articles have issued from the different members of the staff of the hospital during the year, some of the more important of which have been collected into a bulletin which is going to press at the close of the year.

Field work has been taken up, particularly in connection with the discharge of patients, so that the hospital now has a field officer who visits the homes of patients and brings first-hand information to the hospital to aid in the solution of questions of discharge, parole, etc.

FREEDMEN'S HOSPITAL.

There were received into the hospital during the year 3,093 patients, and 292 births occurred. These, with 176 remaining from the preceding year, make a total of 3,561 indoor patients receiving the benefits of the hospital, an increase of 661 over the last fiscal year. Of those under care, 1,853 were chargeable to the District of Columbia and 1,708 to the General Government.

There were discharged during the year 3,056 patients, of whom 1,350 had recovered, 1,280 improved, 188 unimproved, 7 not treated, and 231 died, leaving 213 in the hospital at the close of the year, 89 of whom were residents of the District of Columbia and 124 were from the States. The percentage of deaths from all causes was 2 per cent less than last year. The surgical work involved 1,922 operations, an increase of 155 over the previous year. In the out-patient department 5,710 were treated, an increase of 871 over last year.

In the act "making appropriations for the sundry civil expenses of the Government for the fiscal year ending June 30, 1906, and for

other purposes," approved March 3, 1905, it was provided, among other things, as follows:

The Secretary of the Interior is authorized to enter into contract with the Board of Charities of the District of Columbia for the care and treatment of persons from the District of Columbia admitted to the Freedmen's Hospital; and any money that may be received, from this source, on and after July first, nineteen hundred and five, shall be paid to the Secretary of the Interior, to be applied to the uses and purposes of the hospital.

The account of the Board of Charities with the District of Columbia under the various contracts made for the care of the District indigent from 1906 to 1912 shows a total unpaid balance up to June 30, 1912, of $78,745.57. It is hoped that the Commissioners of the District may see their way clear to include in future estimates to Congress a sum sufficient to cover the contract price for the care of all patients who have been admitted to the hospital as residents of the District of Columbia. The bill rendered during the past year for the care and treatment of this class of patients amounted to $39,239.86, or $5,239.86 more than the appropriation received for this purpose.

The training school for nurses has completed its eighteenth year of work and is represented by 223 graduates. These women are engaged successfully in private nursing, and not a few are engaged in institutional work in various parts of the country. At the graduating exercises held on May 10, 1912, six nurses received their diplomas.

In the act "making appropriations to provide for the expenses of the District of Columbia for the fiscal year ending June 30, 1913, and for other purposes," approved June 26, 1912, provision is made, under the head of "Medical charities," as follows:

Hereafter patients may be admitted to Freedmen's Hospital for care and treatment on the payment of such reasonable charges therefor as the Secretary of the Interior shall prescribe. All money so collected shall be paid into the Treasury to the credit of Freedmen's Hospital, to be disbursed under the supervision of the Secretary of the Interior for subsistence, fuel and light, clothing, bedding, forage, medicine, medical and surgical supplies, surgical instruments, repairs, furniture, and other absolutely necessary expenses incident to the management of the hospital, a report as to the expenditure thereof to be made annually to Congress.

Appropriate regulations have been made for carrying into effect the provisions of the statute, and a number of persons have been accommodated at the hospital under this authority and the moneys received for the services rendered them covered into the Treasury.

Under existing regulations governing the hospital the valuables and effects of patients who die in the hospital are turned over to their heirs or legal representatives, but where the latter can not be located it is necessary to retain the same at the hospital. In order to relieve the hospital of the care of such property appropriate legislation should be enacted by Congress authorizing the disposition thereof.

HOWARD UNIVERSITY.

Howard University was incorporated by the act of March 2, 1867 (14 Stat., 338). The purpose of the incorporation, named in the first section of the act, was "for the education of youth in the liberal arts and sciences." The incorporators were declared to be "a body politic and corporate, with perpetual succession," etc. Control of the university was vested in a board of seventeen trustees. The incorporators and their successors were authorized to take, for the university, property of any character, "by gift, devise, grant, donation, bargain, sale, conveyance, assurance, or will;" to transfer or lease any of the property of the university; and to place at interest, in such manner as the majority of the incorporators or their successors should decide, any funds belonging to the university, and with the general powers usually conferred on corporations with reference to the right to sue and be sued in any courts of law and equity in actions of any character. Congress reserved the right to alter, amend, or repeal the act of incorporation.

The enrollment of the university for the last year was 1,409 from 37 States and 8 foreign countries. This number does not include 35 students who took work in the school of theology by correspondence. The number of students in the different departments was as follows:

College of arts and sciences	243
Teachers' college	139
School of theology	97
School of medicine	341
School of law	121
Academy	355
Commercial college	102
Students in music	75
Manual arts and domestic science	227
Names duplicated because of students taking special courses in different departments	291

Two hundred and eighteen students completed their studies in the university, as follows:

School of theology	27
School of medicine	36
School of dentistry	28
School of pharmacy	10
School of law	28
College of arts and sciences	31
Teachers' college	10
Domestic arts and domestic science	8
Normal course	4
Kindergarten	1
Academy	29
Commercial college	5
Music department	1

The school of theology receives no aid from Congress, but is supported entirely through endowments and special gifts. It requires no doctrinal tests, is interdenominational, and is open for all who are preparing for efficiency in moral and religious work.

Although the institution was established in 1867, no appropriation was made by Congress for its support until March 3, 1879, when $10,000 was appropriated "for maintenance." From March 3, 1879, to August 24, 1912, Congress appropriated for the university a total of $1,478,340.

A report of the treasurer of the university, dated November 8, 1912, shows that on September 30, 1912, the total value of all property belonging to the university was $1,668,902.64, of which $393,917.36 represents endowments, including land other than that used directly. The sum of the appropriations made by Congress and the endowments is $1,872,257.36, and the plant, therefore, as it stood on September 30 was worth $203,354.72, less than the aggregate amount of the endowments and the total amount appropriated by Congress for all purposes. During the last year there was a decrease in the total amount of the endowments, which was occasioned by reason of the sale of lot 17, square 3060, to the District of Columbia, at a price less than that at which it was carried on the books of the university, and because of the readjustment of special assessments on the unproductive property. The total deductions amounted to $1,694.10. Under existing law this Department has no representative on the board of trustees, although it has for several years given administrative examination to the accounts of the special disbursing officer handling appropriations made by Congress for the university. Neither has the Government title to any buildings erected or improvements made to buildings from congressional appropriations. In the annual report for last year with reference to this subject I said:

> Considering the magnitude of the appropriations made by Congress for the maintenance, improvement, etc., of the university, and the statement of the president thereof, it is manifest that the Government should have greater supervision over the institution, and it is therefore recommended that the act of incorporation of March 2, 1867, be so amended as to give the Government a proper representation on the board of trustees, that appropriations made by Congress shall be expended under the direction of the Secretary of the Interior, and that the institution be required to protect the United States against possible transfer or loss of the lands upon which buildings have heretofore or may hereafter be erected from funds provided by the Government.

This recommendation is renewed.

THE COLUMBIA INSTITUTION FOR THE DEAF.

The total enrollment for last fiscal year was 130 students, of which 68 were males and 62 females. Eighty-five were enrolled in the collegiate department, representing 27 States, the District of Colum-

bia, and Canada, and 45 attended the primary department. Thirty-six students were admitted as beneficiaries from the District of Columbia. During the fiscal year 33 were discharged from the institution by graduation and otherwise. The course of instructions as adopted early in the year was carried into effect, with the addition of practical instructions in dairy work, gardening, library cataloging, and the science of living. Excellent health has prevailed among all the students.

An official survey of the grounds of the institution was made, which showed the area to be approximately 103 acres.

At the close of the term 4 normal students received the degree of master of arts, 17 that of bachelor of arts, 2 the degree of bachelor of philosophy, and 1 the degree of bachelor of laws. A normal certificate was issued to 1 normal student. Graduates of the higher departments of the institution are largely engaged in teaching, farming, and business, and have been almost universally successful.

As has heretofore been said in annual reports of the Department, the only duty devolved on the Secretary in relation to the institution is the reception of the annual report thereof and the admission of indigent deaf mutes from the several States and Territories for instruction in the collegiate branch thereof.

In my last annual report I recommended that the entire control and management of the institution for the deaf be vested in the president and board of directors, and that they be required to report direct to Congress as to the administration of the institution. This recommendation is renewed.

MARYLAND SCHOOL FOR THE BLIND.

Section 2 of the act of Congress approved May 29, 1858 (11 Stat., 294), authorizes the Secretary of the Interior to place for instruction in an institution for the blind, in the State of Maryland or some other State, the indigent blind children of teachable age who are children of persons actually engaged in the military and naval services of the United States. No permits for this class of beneficiaries wer issued during the past year.

SUPERINTENDENT OF THE UNITED STATES CAPITOL BUILDING AND GROUNDS.

The Superintendent of the United States Capitol Building and Grounds, in his annual report of the operations of his office, specifies in detail the various improvements, changes, and repairs made to the Capitol and other buildings under his supervision.

In the Capitol, among other repairs and improvements, there have been installed in the kitchens of the Senate and House restaurants two refrigerating machines, with the attendant repairs to ice boxes

and changes needed to equip a refrigerating plant adapted for the purposes of the service required. The House restaurant has been completely remodeled, and the customary repairs made in committee rooms, corridors, and other portions of the Capitol, including necessary attention to the questions of heating, ventilation, and sanitation.

Work on the Capitol Grounds included the formation of a new park area in the large court of the Senate Office Building and the installation of a central fountain. The work of tree pruning and surgery has resulted in saving many historic trees, and the planting of new trees has been made an important feature of this work. The walks and drives have been repaired and careful attention given to the care of small shrubs injured by the severe winter of the last season.

In the engine house and Senate and House stables such attention was given to plumbing, painting, repairs to stalls, etc., usually required in buildings of this class whose occupancy extends over a long period.

Repairs at the United States courthouse included painting, plastering, concrete and brick work, plumbing, and the installation of new fixtures in closets and lavatories where such changes have been needed. At the Botanic Garden changes in the heating plant by the installation of new boilers and changes in old boilers have been made. The plant houses have been repaired and necessary glazing and painting attended to.

During the fiscal year ended June 30, 1912, the expenditures under various appropriations have been as follows: Capitol Building and repairs, $33,500; improving Capitol grounds, $37,000; Capitol power plant, $90,000; engine house and Senate and House stables, $1,500; and repairs to courthouse, District of Columbia, $10,000.

GENERAL EDUCATION BOARD.

This corporation was created by the act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report in writing stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same, or the income thereof during the preceding year. It has for its object the promotion of education within the United States. The corporation owns no real estate, its property consisting of securities and money divided into various funds, according to the purpose for which it is to be used.

On June 30, 1912, the capital funds belonging without restriction to the board amounted to $31,994,437.58, invested as follows: Bonds, $15,735,423.28; stocks, $16,103,636.18.

The income from the above funds, together with the income from undisbursed income, including income earned but not received, amounted during the year to $1,902,280.81, from which was deducted a loss of $2,853.65 occasioned by the sale of securities representing invested income, leaving a net amount of $1,899,427.16. The balance of income from previous years as of June 30, 1911, amounting to $4,212,721.81, increased the total to $6,112,148.97.

Disbursements from income during the year were as follows:

Payments on account of appropriations to colleges, universities, etc	$1,018,870.63
Payments on account of appropriations for farmers' cooperative demonstration work carried on by the United States Department of Agriculture	121,798.54
Payments made on account of appropriations for salaries and expenses of professors of secondary education in Southern States	30,356.59
Payments made on account of appropriations for salaries and expenses of Negro rural school supervisors	4,000.00
Expenses	33,320.38
Total	1,208,346.14

This leaves an undisbursed balance of income on June 30, 1912, of $4,903,802.83. It is invested as follows: Bonds, $3,315,750.44; stocks, $944,228.49; income receivable, $248,409.40; accounts receivable, $2,177.95; cash, $393,236.55. It should be noted, however, that against this balance there are unpaid appropriations amounting to $4,661,178.26.

The John D. Rockefeller special fund is a fund which Mr. Rockefeller controls both as to principal and income. In a previous report a gift to the University of Chicago of $9,912,540.74 was published. One-tenth of this gift (or securities and cash representing it) is payable each year. The income from the unpaid balance, however, remains the property of the board subject to Mr. Rockefeller's direction. This accounts for the disparity between the balance of the John D. Rockefeller special fund and the income account of the same name. On June 30, 1912, the principal fund amounted to $1,002,150.25, invested as follows: Bonds, $930,622.50; stocks, $68,633.32; cash, $2,894.43. No gifts were made from this fund during year. The income earned during the year was $486,872.57, the balance from previous years ($718,569.91) increasing the amount to $1,205,442.48. Disbursements during the year were as follows:

Gifts to the Rockefeller Institute for Medical Research	$222,283.65
Gifts to the University of Chicago	20,000.00
Expenses	1,533.20
Total	243,816.85

This leaves a balance of $961,625.63, which is invested as follows: Bonds, $583,234.39; stocks, $147,970.20; income receivable, $94,637.29; cash, $135,783.75.

The Anna T. Jeanes fund, the income to be used for Negro rural schools, still amounts to $200,000. It is invested as follows: Bonds, $182,877.51; stocks, $16,645; cash, $477.49.

The income from this fund during the year was $9,240.99. Added to the balance from the previous year, the total available income amounted to $14,363.25. Of this $4,540 was appropriated and paid to various schools and $40.72 paid out for expenses, leaving a balance of $9,782.53, all in cash.

MEMORIAL TO JOHN WESLEY POWELL.

The sundry civil act approved March 4, 1909 (35 Stat., 992), appropriated $5,000 for the purpose of procuring and erecting on the brink of the Grand Canyon, in the Grand Canyon Forest Reserve in Arizona, a memorial to the late John Wesley Powell, in recognition of his distinguished public services as a soldier, explorer, and administrator of Government scientific work, and providing that the design for the memorial and the site should be approved by the Secretary of the Interior. As stated in my last annual report, an advisory committee was designated, consisting of Dr. W. H. Holmes, chief of the Bureau of Ethnology, Dr. C. D. Walcott, secretary of the Smithsonian Institution, and Col. H. C. Rizer, chief clerk of the United States Geological Survey, to assist the Secretary of the Interior in determining the character of the monument and the selection of the best site. This committee has submitted a tentative design for the monument, prepared by Mr. J. R. Marshall, and upon consideration thereof the whole matter was referred to the Fine Arts Commission for an expression of its views as to the suitability of the design in question. The commission has approved certain features of the design, but is withholding final report for further consideration.

MARITIME CANAL COMPANY OF NICARAGUA.

Section 6 of the act of Congress approved February 20, 1889, entitled "An act to incorporate the Maritime Canal Company of Nicaragua" (25 Stat., 675), provides:

> Said company shall make a report on the first Monday of December in each year to the Secretary of the Interior, which shall be duly verified on oath by the president and secretary thereof, giving such detailed statement of its affairs, and of its assets and liabilities, as may be required by the Secretary of the Interior, and any wilfully false statement so made shall be deemed perjury, and punishable as such. And it shall be the duty of the Secretary of the Interior to require such annual statement and to prescribe the form thereof and the particulars to be given thereby.

The report of this corporation has been duly transmitted to Congress. In view of the fact, however, that the Maritime Canal Co. of Nicaragua has no relations whatever with this Department and the Secretary has no duty to perform thereto, except as specified in the above-mentioned law, the recommendation contained in my last annual report, that the act be so amended as to require the corporation to submit directly to Congress such form of report as it may prescribe, is renewed.

Very respectfully,

WALTER L. FISHER,
Secretary.

The PRESIDENT.

APPENDICES.

APPENDIX A.

Land classification with progress of coal classification and valuation.

STATUS ON JULY 1, 1911.

State.	Withdrawals outstanding.	Coal lands classified.	Valuation.	Valuation at minimum price.
	Acres.	*Acres.*		
Alaska	(1)			
Arkansas		60,715	$1,473,762	$1,214,280
Arizona	118,718			
California	239,903	7,720	585,086	154,404
Colorado	5,517,338	2,873,929	167,775,104	50,309,589
Idaho	6,985,417			
Montana	19,890,471	3,512,348	94,463,647	76,398,380
Nevada	92,141			
New Mexico	5,809,490	954,214	21,261,664	13,523,792
North Dakota	18,454,490	230,814	4,582,860	4,582,860
Oregon	3,521	1,897	49,909	37,919
South Dakota	2,375,263			
Utah	6,221,314	636,479	36,576,849	8,287,783
Washington	2,210,807	40	2,000	800
Wyoming	7,013,543	7,147,719	381,804,858	109,933,717
Total	74,932,416	15,425,875	708,575,739	264,443,524

STATUS ON JULY 1, 1912.

Alaska	(1)			
Arkansas		60,715	$1,473,762	$1,214,280
Arizona	118,718			
California	239,903	7,720	585,086	154,404
Colorado	8,245,063	2,880,215	168,374,600	50,435,309
Idaho	1,566,918			
Montana	17,642,291	4,171,955	[2]105,320,836	86,507,003
Nevada	92,141			
New Mexico	5,750,440	954,052	21,280,162	13,520,352
North Dakota	18,454,410	230,814	4,584,255	4,584,255
Oregon	3,521	1,897	49,909	37,919
South Dakota	866,809	82,217	831,270	831,270
Utah	6,364,783	670,306	38,323,592	8,678,513
Washington	2,206,190	40	2,000	800
Wyoming	6,664,302	7,179,474	382,221,890	110,432,145
Total	68,215,489	16,239,445	723,047,362	276,396,250

[1] Area unknown.

Land classification with progress of coal classification and valuation—Contd.

STATUS ON DECEMBER 1, 1912.

State.	Withdrawals outstanding.	Coal lands classified.	Valuation.	Valuation at minimum price.
	Acres.	*Acres.*		
Alaska	(1)			
Arkansas		60,715	$1,473,762	$1,214,280
Arizona	118,718			
California	239,903	7,720	585,086	154,404
Colorado	7,493,290	2,884,080	168,487,586	50,512,609
Idaho	1,566,918			
Montana	17,441,128	4,171,995	105,320,836	86,507,003
Nevada	92,141	800	16,000	16,000
New Mexico	5,739,367	954,052	21,280,162	13,520,352
North Dakota	17,343,456	1,448,978	24,145,545	24,145,545
Oregon	26,561	1,897	49,909	37,919
South Dakota	610,754	82,217	831,270	831,270
Utah	6,364,623	670,306	38,323,592	8,678,513
Washington	2,206,150	40	2,000	800
Wyoming	6,666,703	7,177,269	332,122,501	110,388,045
Total	65,909,712	17,460,069	742,638,249	296,006,740

[1] Area unknown.

Oil-land withdrawals and restorations.

State.	Withdrawals outstanding July 1, 1911.	Fiscal year ended June 30, 1912.		Withdrawals outstanding July 1, 1912.	Period July 1, 1912, to Dec. 1, 1912.		Withdrawals outstanding Dec. 1, 1912.
		New withdrawals.	Restorations.		New withdrawals.	Restorations.	
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Arizona	230,400			230,400			230,400
California	1,592,704	23,947	640	1,616,011		133,626	1,482,385
Colorado	87,474			87,474			87,474
Louisiana	414,720			414,720			414,720
New Mexico	419,901		419,901				
Oregon	74,849			74,849			74,849
Utah	581,566	1,370,760		1,952,326			1,952,326
Wyoming	568,815		170,413	398,402	36,746		435,148
Total	3,970,429	1,394,707	590,954	4,774,182	36,746	133,626	4,677,302

Petroleum Naval Reserve No. 1, California No. 1, approved by President September 2, 1912, involved 38,068 acres included in outstanding oil reserves.

Phosphate land withdrawals and restorations.

State.	Withdrawals outstanding July 1, 1911.	Fiscal year ended June 30, 1912.		Withdrawals outstanding July 1, 1912.	Period July 1, 1912, to Dec. 1, 1912.		Withdrawals outstanding Dec. 1, 1912.
		New withdrawals.	Restorations.		New withdrawals.	Restorations.	
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Florida	37,839		2,199	35,640	8,140		43,780
Idaho	952,388	354,717	249,049	1,058,056			1,058,056
Montana	33,950	240,911		274,861			274,861
Utah	107,745			107,745			107,745
Wyoming	1,267,494	597,591	826	1,864,259	10,383	67,557	1,807,085
Total	2,399,416	1,193,219	252,074	3,340,561	18,523	67,557	3,291,527

Power-site reserves.

State.	Withdrawals outstanding July 1, 1911.	Fiscal year ended June 30, 1912.		Withdrawals outstanding July 1, 1912.	Period July 1, 1912, to Dec. 1, 1912.		Withdrawals outstanding Dec. 1, 1912.
		New withdrawals.	Restorations.		Withdrawals.	Restorations.	
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Arizona	213,390	3,019	23,448	192,961	.....	5,730	187,231
California	53,689	115,383	4,064	165,008	34,453	3,750	195,711
Colorado	209,174	39,278	3,799	244,653	.....	.....	244,653
Idaho	229,692	72,432	6,667	295,457	15,302	19,774	290,985
Minnesota	8,388	2,866	.....	11,254	.....	.....	11,254
Montana	127,687	31,097	7,678	151,106	83	1,500	149,689
Nevada	15,375	.....	80	15,295	.....	.....	15,295
New Mexico	9,706	4,830	.....	14,536	.....	959	13,577
Oregon	161,795	24,367	1,919	184,243	9,684	110	193,817
Utah	347,252	27,778	.....	375,030	.....	.....	375,030
Washington	80,386	29,734	6,979	103,141	2,787	7,075	98,853
Wyoming	58,889	2,660	480	61,069	22	5,245	55,846
Total	1,515,423	353,444	55,114	1,813,753	62,331	44,143	1,831,941

Public water reserves.

State.	Withdrawals outstanding July 1, 1911.	Fiscal year ended June 30, 1912.		Withdrawals outstanding July 1, 1912.	Period July 1, 1912, to Dec. 1, 1912.		Withdrawals outstanding Dec. 1, 1912.
		New withdrawals.	Restorations.		New withdrawals.	Restorations.	
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Utah	.....	23,143	.....	23,143	.....	.....	23,143
Wyoming	.....	62,979	.....	62,979	.....	.....	62,979
Total	.....	86,122	.....	86,122	.....	.....	86,122

Enlarged homestead designations.

State.	Acreage designated July 1, 1911.	Fiscal year July 1, 1911, to June 30, 1912.		Acreage designated July 1, 1912.	Period July 1, 1912, to Nov. 30, 1912.		Acreage designated Dec. 1, 1912
		Designations.	Cancellations.		Designations.	Cancellations.	
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Arizona	26,589,917	389,320	19,458	26,959,779	.....	.....	26,959,779
Colorado	20,354,509	11,027	.....	20,365,536	.....	.....	20,365,536
Idaho:							
Sections 1–5 only	5,336,838	91,731	3,941	5,424,628	160	.....	5,424,788
Section 6	3,841	5,723	1,763	7,801	.....	.....	7,801
Total	5,340,679	97,454	5,704	5,432,429	.....	.....	5,432,589
Montana	31,853,530	175,566	320	32,028,776	3,280	646	32,031,410
Nevada	49,512,960	.....	.....	49,512,960	.....	.....	49,512,960
New Mexico	16,306,675	136,977	.....	16,443,652	1,462,042	.....	17,905,694
Oregon	11,213,661	144,227	.....	11,357,888	18,447	.....	11,376,335
Utah:							
Sections 1–5 only	6,765,780	177,891	.....	6,943,671	3,232	[1] 4,552	6,942,351
Section 6	1,374,947	16,380	189,727	1,201,600	10,224	[2] 160	1,211,664
Total	8,140,727	194,271	.....	8,145,271	13,456	4,712	8,154,015
Washington	3,402,896	.....	.....	3,402,896	.....	.....	3,402,896
Wyoming	17,538,941	52,671	3,639	17,587,973	2,825	.....	17,590,798
Total	190,254,495	1,201,513	218,848	191,237,160	1,500,210	5,358	192,732,012

[1] Due to redesignation from sections 1–5 only to section 6.
[2] Transferred from section 6 to sections 1–5 only.

Mineral-land withdrawal.

State.	Withdrawals outstanding July 1, 1911.	Fiscal year ended June 30, 1912.		Withdrawals outstanding July 1, 1912.	Period July 1, 1912, to Dec. 1, 1912.		Withdrawals outstanding Dec. 1, 1912.
		New withdrawals.	Restorations.		New withdrawals.	Restorations.	
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Arizona					9,787		9,787
* * *	*	*	*	*	*	*	

Location area, and characteristics of national parks.

Name	Location.	When established.	Area (acres).	Private lands (acres).	Visitors. 1912.	Special characteristics.
Yellowstone	Wyoming, Montana, and Idaho.	Mar. 1, 1872	2,142,720	None.	22,970	Wonderful scenery, geysers, boiling springs, mud volcanoes and springs, mountains, grand waterfalls, brilliant-hued canyons, great lake 8,000 feet above the level of the sea; wild animals.
Yosemite	California	Oct. 1, 1890	719,622	19.827	10,884	Mountain scenery, magnificent waterfalls, the Hetch Hetchy and Yosemite Valley, ice-sculptured canyons, glacier lakes, forests.
Sequoia	do	Sept. 25, 1890	161,597	3,716.96	2,923	The home of the "Big Tree" (Sequoia gigantea), growing to a height of 300 feet with a diameter of 30 feet, the bark being 2 feet thick; rugged and picturesque scenery, beautiful cascades and falls, and wonderful caves.
General Grant	do	Oct. 1, 1890	2,536	160	2,240	
Mount Rainier	Washington	Mar. 2, 1899	207,360	18.2	8,946	Glaciers and wild mountain scenery.
Crater Lake	Oregon	May 22, 1902	159,360	2,458.11	5,235	Rugged mountain scenery, beautiful lake within the crater of an extinct volcano, etc.
Wind Cave	South Dakota	Jan. 9, 1903	10,522	160	3,199	Well known for a cavern having many miles of galleries and numerous chambers of considerable size containing many peculiar formations.
Platt	Oklahoma	July 1, 1902; Apr. 21, 1904	848.22	None.	31,000	Noted for its bromide and other springs, the waters of which have medicinal qualities; park well wooded, scenery picturesque.
Mesa Verde	Colorado	June 29, 1906	42,376	880	230	Set aside to preserve the prehistoric ruins of an ancient people; rugged scenery.
5-mile strip for protection of ruins	do	do	175,360			
Hot Springs Reservation	Arkansas	June 16, 1880	911.63	None.	135,000	Famous for its thermal springs, having wonderful medicinal qualities.
Glacier	Montana	May 11, 1910	981,681	16,668.11	6,257	Famed for its beautiful lakes derived from glaciers, lofty mountains clad with forests, magnificent glacial formations, numberless waterfalls. Game, fish, and birds abound.
Sullys Hill	North Dakota	Apr. 27, 1904	780	None.	[1] 200	Small rugged hills containing prehistoric ruins. Practically a local park.
Casa Grande Ruins	Arizona	Mar. 2, 1889	480	None.	450	These ruins are one of the most noteworthy relics of a prehistoric age and people within the limits of the United States. Discovered in ruinous condition in 1694.

[1] Estimated.

REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., October 1, 1912.

SIR: The following report of the work in the General Land Office for the fiscal year ended June 30, 1912, and recommendations for change in legislation are respectfully submitted:

CENTENNIAL.

The year 1912 was the centennial year of the creation of the General Land Office as a separate bureau. Prior to the time of its creation, duties similar to those which were placed by statute upon the newly-created office of commissioner were performed by an officer designated as surveyor general. The disposition of the public lands being under a system of sale, the jurisdiction naturally fell to the Secretary of the Treasury. The surveyor general's office was therefore in the Treasury Department.

When the position of commissioner was created by the act of April 25, 1812, the bureau thus coming into existence was still retained under the jurisdiction of the Treasury Department, remaining there until March 3, 1849, when it became a part of the Interior Department. The first Commissioner of the General Land Office, Edward Tiffen, of Ohio, took the office on May 7, 1812, and on May 7, 1912, the centennial was celebrated by the holding of suitable ceremonies in Continental Hall, permission being kindly granted for that purpose by the Daughters of the American Revolution.

Under the organization of the General Land Office as a separate bureau in 1812, the following force was employed in Washington: Commissioner, chief clerk, draftsman, general clerk, and 6 junior clerks. There were at that time 19 local land offices, and 1 office of surveyor general.

On June 30, 1912, there were in this bureau, in the field, and in Washington, employees classified as follows:

In General Land Office, Washington, D. C.	532
In 13 offices of surveyor general	174
In 102 district land offices	414
In the field service	180
In the surveying service	102
In Chippewa logging service	17
Total	1,419

GENERAL STATEMENT.

The number of patents written last year was 67,475, as against 72,189 for the prior year. This is somewhat less than the number written for the prior year, not due to less work being performed in the office, but because there were less patents to be written. The work of the office is up to date with very few minor exceptions. In homestead cases patents are being written within four months from the date of proof. It would not be advisable to shorten this inter-

vening length of time; some period should be allowed so that fraud, if it exists, may be found.

The correspondence of the office shows that there were received last year 362,916 letters, of which 254,842 were answered by letter, circulars being sent to the remainder.

CASH RECEIPTS AND EXPENDITURES.

The total cash receipts from the sale of public lands, including fees and commissions on both original and final entries, for the fiscal year 1912 were $6,671,718.54. Miscellaneous receipts were as follows: From sales of Indian lands $2,284,538.37; reclamation water-rights charges, $914,542.31; sales of timber in Alaska, depredations on public lands, sales of Government property, and copies of records and plats, $102,248.78, making the aggregate total of cash receipts of this bureau during the fiscal year 1912, $9,973,048, a decrease of $1,116,879.60, as compared with those for the fiscal year ended June 30, 1911.

The total expenses of district land offices for salaries and commissions of registers and receivers, incidental expenses, and expenses of depositing public moneys during the fiscal year ended June 30, 1912, were $850,121.04, a decrease of $20,120.96. The aggregate expenditures and estimated liabilities of the public-land service, including expenses of district land offices and surveys, were $3,573,692.88, leaving a net surplus of $6,399,355.12.

AREA OF LAND ENTERED AND PATENTED.

The total area of public and Indian land originally entered during the fiscal year ended June 30, 1912, is 14,574,688.82 acres, a decrease of 3,064,410.72 acres as compared with the area entered during the year 1911.

The area patented during the fiscal year is 10,135,475 acres, a decrease of 2,137,020 acres as compared with the fiscal year 1911. Of the above area 5,011,948 acres were patented under the homestead law.

* * * * * * *

FORMULATION OF CHARGES.

There is another important change which was made during the latter part of the last fiscal year.

The work of the office is diversified, and in order that it may be properly carried out it has always been divided into different classes, and separate divisions created, work of a certain character being allotted to each one. While this is essential to the perfection of the work of the office, yet any decision or letter which was written concerning the case is signed by the commissioner or the assistant commissioner, and therefore is an office letter and not a division decision. Under this necessary organization it can be easily seen that constant care has to be taken to prevent the work being considered as division work and not work of the office.

An allegation of facts comprising a noncompliance with the law leads to the setting of a case for hearing. After the determination of these charges in the past there have been raised questions of noncompliance with the technical requirements of the law, not touched

upon in the hearing or advanced in the charge leading thereto, the questions then raised generally touching upon fraud. The result has been that in a certain class of cases after hearing had and decision rendered in favor of the defendant, it is found upon a close examination of the papers in the division having ultimate jurisdiction, that there are points of non-compliance with the requirements of the law, which do not possess fraud features, which were not presented at the hearing had. As a result the claimant, after having fought his case on the charges made, was confronted with new defects which he is called upon to cure. This procedure was erroneous, and a change has been made. Now, prior to the setting of the case for hearing, the papers are examined and considered by the division having jurisdiction over the proof itself, and all matters which stand in the way of the issuance of patent are advanced at one and the same time. It is hoped that the institution of this procedure, and the correction of the erroneous steps which have heretofore been taken, will cure the complaint which has been found to exist: That, after hearing had, the office advances further complaints and seems to have assumed the attitude of endeavoring to block progress by constantly finding new faults.

AGENTS' REPORTS NOT CONSIDERED IN ADJUDICATING CASES WHERE TRIAL HAD.

During the past year steps have been taken to completely segregate the reports of special agents made on any cases upon which hearing has been had. In no instance is a report of an agent allowed to be placed with the testimony and evidence taken in a case. The adjudicating lawyer is permitted to see the testimony only, and he must make up his mind on the merits of the case as presented at the hearing. It has never been the idea of this office that the report of an agent should have any weight in the determination of a case after trial had, and directions that the reports be not consulted were given two years ago. In the fear that the agent's report might unwittingly influence the adjudicating officer, if left with the papers and therefore accessible, it has been deemed best to see that the report is placed in a separate file and not sent down to the division having the duty of deciding the case.

FIELD SERVICE.

Herewith is submitted a comparative statement showing the results accomplished during the fiscal years 1909–10, 1910–11, and 1911–12, by the Field Service under appropriations for said fiscal years in the sums of $1,000,000, $750,000 and $650,000 respectively.

Comparative statement showing results accomplished by the field service during the fiscal years 1910, 1911, and 1912.

	1909–10	1910–11	1911–12
Appropriated	$1,000,000.00	$750,000.00	$650,000.00
Special agents	216	155	147
Collected	$349,234.01	$229,193.68	$264,760.93
Acres restored	2,522,539.43	2,200,401.25	1,440,356.64
Entries examined and reports submitted	22,077	26,505	27,188
Adverse reports	7,814	10,022	10,036
Favorable reports	12,734	16,483	17,152
Civil suits recommended	867	530	183
Civil suits won	304	304	281
Civil suits lost	71	82	90
Indictments	513	236	180
Convictions	162	124	84
Prison sentences	25	47	26
Fines imposed	$76,706.97	$40,540.78	$8,472.00
Paid	$65,363.22	$19,837.56	[1] $12,645.00
Acquittals and dismissals	429	377	221

[1] Which includes payments on old cases.

Fines paid are included in total amount collected.

Alleged fraudulent entries acted on during the year in General Land Office.

	1909–10	1910–11	1911–12
Pending June 30	[1] 19,772	[2] 23,304	[3] 28,100
Received	20,060	23,353	22,590
Approved	4,884	6,649	5,474
Canceled	4,665	4,398	4,004
Otherwise disposed of	7,265	7,510	22,291
Hearings ordered, General Land Office	6,852	3,008	2,298
Hearings ordered, Forest Service	366	64	26

[1] June 30, 1909. [2] June 30, 1910. [3] June 30, 1911.

This comparative statement evidences, in a graphic manner, the increasing efficiency of the Field Service force. It shows, among other things, that in the fiscal year 1909–10, with an average force of 216 agents, 22,077 entries were examined and reported upon; that in the fiscal year 1910–11, with an average force of 155 agents, 26,505 entries were examined and reported upon, and that during the fiscal year 1911–12, with an average force of only 147 agents, 27,188 entries were examined and reported upon.

The fact that this table shows that a smaller acreage was restored to the public domain during the fiscal year 1911–12, as compared with the two prior fiscal years mentioned in the table, is, of course, accounted for when it is realized that the lands that have been restored to the public domain during the past fiscal year as a result of Field Service investigations and action through the courts based upon Field Service reports, were, in general, illegally acquired or inclosed some years ago, and, of course, the acreage restored will continue to diminish as the cases pending are disposed of.

It will be observed also, that the number of civil suits recommended has diminished from 867 in the fiscal year 1909–10, to 183 recommended in the fiscal year 1911–12. This also is accounted for by the fact that old cases are being rapidly disposed of and offenses of this kind are much less common than in former years.

The heading "Alleged fraudulent entries acted on during the year in the General Land Office," for the same three fiscal years shows

that on June 30, 1911, there were 28,100 cases pending in the General Land Office, while the tabulation shows that on June 30, 1912, there were only 18,921 cases pending in the office.

Attention has been invited to the few points above indicated merely for the purpose of indicating the steady growth in efficiency, not only of the Field Service force, but also of the force of the General Land Office in Washington in disposing of pending cases.

ALASKA.

It is especially desired to emphasize the excellent progress made by the Field Service in the disposition of the Alaskan coal land investigations.

During the past year very substantial progress has been made in the investigation of coal claims in the Territory of Alaska. During the open season several parties of mineral experts were placed in the field for investigating on the ground these claims to determine whether or not the legal requirements have been met as to opening or improving a mine on the claims. The special agents assigned to the Alaska field division have been engaged in the investigation, both in Alaska and in the States, of these claims to ascertain whether or not the claims were bona fide or had been located as a result of unlawful combinations or agreements. As a result of these investigations, reports have been submitted on 454 claims, and these, with the investigations previously made, make a total of 930 claims in which investigation has been completed. As there are 1,129 coal locations pending before the office there are but 199 which have not been investigated. Of this latter number, 144 have been either canceled or held for cancellation for failure to submit applications for patent within the time required by law, so that but 55 claims remain for investigation, and it may be that only a portion of that number will require investigation, as applications for patent may not be made for some of the claims included in this number.

During the year adverse proceedings have been directed against 188 claims, which, together with those previously proceeded against, brings the total number of claims against which adverse proceedings have been instituted up to 300. Of this number, 219 are at issue on answers to charges upon which the proceedings were directed. Of the total 1,129 claims pending, 407 have been canceled and 176 held for cancellation as the result either of adverse proceedings or of the failure of the claimants to apply for patent within the statutory period.

It is expected that during the present field season all of the remaining uninvestigated cases which are ready for investigation will be examined. The efforts of the office will during the coming year be directed specifically to the trial and disposition of the cases which have been adversed and are now at issue, and it is expected that these trials will all be had during the present year.

While the investigation of the coal claims has been the principal concern of the office, yet there are other lines of work in Alaska which are demanding attention, principal among which are the investigation of timber trespasses and the investigation of applications to cut timber. The new rules and regulations relating to the latter, which were promulgated during the past year, are meeting the conditions which exist there and have resulted in much more expedition in the handling

of this work. However, this line of investigation has proved embarrassing because of vast distances which must be traveled in order to look after these cases and the meager and inadequate transportation facilities afforded.

Request was made on Congress for an item of $5,000 for the purchase of a launch to facilitate the investigation of timber trespasses in Alaska and to aid, furthermore, in the dispatch of the work done in Alaska, because of the lack of proper transportation facilities at the present time. Should Congress see fit to approve this item it is felt that much greater dispatch will be shown during the present fiscal year in the handling of all Alaskan cases now pending.

While Congress has seen fit to cut the appropriation requested for the present fiscal year from $650,000 to $500,000, with the result that about thirty members of the force will be eliminated, no change has been made in the allotment of agents to the Alaskan work because of this reduction in the appropriation. This is consistent because of the desire of the department to dispose of the Alaskan investigations with all possible expedition.

CALIFORNIA OIL LANDS.

Especial attention is called to the work of the field force in connection with the California oil-land investigations during the past fiscal year.

There are at present included in withdrawals in California over 1,500,000 acres of land containing many of the finest petroleum deposits in the country. Title to a considerable part of this area is still in the Government. Several suits have been brought, and others are contemplated, having for their object the recovery of title to a large part of these lands obtained through patents from which mineral lands were excluded. There are 6,000 acres of land involved in one of these suits. Of the lands withdrawn, approximately 100,000 acres are covered by about 934 pending entries and selections, comparatively few of which are for mineral title. Much of the remainder is covered by mineral locations of oil, gypsum, asphaltum, and fuller's earth placer claims. The lands are generally desert in character, with no available water supply for irrigation. By reason of the withdrawal of these lands and the conditions imposed thereby, an examination of these lands and an investigation of all entries or selections thereon are necessary in every case where title is sought. To meet these requirements a considerable number of special agents and mineral inspectors of the Field Service of the General Land Office have spent practically their entire time on this work. In some instances it has become necessary to delay work pending in other divisions in order to furnish a proper measure of cooperation on the part of our force to the Department of Justice in preparing and conducting these suits. The excellent results of this cooperation have been strongly shown, the Department of Justice having expressed itself in the highest terms of approval concerning the work done by our field agents.

It also became necessary during the past fiscal year to make a reconnoissance of about 440,000 acres of land within the withdrawals for the purpose of ascertaining the character of said lands. These examinations were in addition to the work incident to the suits re-

ferred to and were principally for use in hearings in which the Government appears as contestant or intervenor. These investigations already have been justified by the important evidence adduced and will go a long way in establishing the Government's contention with respect to said lands.

It is of course apparent that the general work of the two field divisions covering California has fallen considerably in arrears because of this demand on our men in these special investigations, and in view of the recent reduction of our appropriation by Congress in the sum of $150,000 it will tax the ingenuity of the department to meet these and other demands on the Field Service as a whole during the coming fiscal year. One result of the reduction in our appropriation so far has been the elimination of 26 members of the field force maintained during the past fiscal year, and it may be that other eliminations will eventually become necessary.

The immense values at stake in these oil lands are indicated to some extent by the fact that many tracts have been sold in the proven areas at a rate as high as $2,000,000 and $3,000,000 per section.

The reduction of the appropriation necessarily requires some readjustment in the distribution of the present field force and reductions in the present force.

Every effort has been made during the past fiscal year to dispose of old cases, especial preference being given to claims involving settlers' rights. The result is that at the present time a negligible percentage of such claims have been pending in the field for investigation for a period greater than six months.

Instructions have been issued to all chiefs of field divisions that because of the reduction of the field force they will be held to a stricter accountability for the use of the time of their men during the present fiscal year than heretofore, and in view of the remarkably increased efficiency of the force, as shown by the tabulations to which attention is called herein, there is no doubt that the work will be handled in a thorough and expeditious manner during the present fiscal year.

The office has suffered during the past fiscal year from the loss of some very valuable members of the force, who received more attractive offers in private business and therefore resigned. The force as it stands at present, however, is without doubt as creditable an administrative organization as can be found in any branch of the Government service, and its members show proper breadth of view in the many complicated problems presented to them in making field investigations. It was, of course, inevitable that when the men were younger in the service and were less confident, because of the lack of experience, some small percentage of cases arose through unnecessary technical distinctions. The attitude of the men toward their work is broad minded, and does full justice not only to the Government but also to the public-land claimant. It is gratifying to be able to record this fact in view of the constant effort of this office to have the field force conduct their investigations in a spirit of fairness to all concerned.

It is desired to express my unqualified appreciation of the enthusiastic cooperation the Field Service has received during the past fiscal year from the Department of Justice, the Geological Survey, and the Forest Service. The cooperative agreement between the General

Land Office and the Geological Survey as recently modified has given exceptional results. Before the final modification of this agreement the practice was to make a field examination and subsequently to call upon the Geological Survey for data with reference to the character of the land. The new idea is first to obtain from the Geological Survey any data it may possess and then refer the case to the field for investigation. The distinct advantage of the new system over the old is that the agent in the field has in his possession at the time that he makes his examination all of the data available to the survey, and consequently the investigation in the field, where it is necessary to all, is more comprehensive. A gratifying feature of our cooperative work in this particular is the great number of cases found upon receipt of reports from the Geological Survey not to require field investigation at all as to the character of the lands. This, of course, results in a great saving of time and expense, not only to the Government but also to public-land claimants.

* * * * * * *

REPAYMENTS.

The existing laws governing repayments, section 2362, United States Revised Statutes, act of June 16, 1880 (21 Stat., 287), and the act of March 26, 1908 (35 Stat., 48), provide for the return of moneys covered into the Treasury of the United States, received in connection with the disposal of the public lands, to be repaid to the entryman, or his legal representative, in the absence of fraud on their part, in all cases where lands have been erroneously sold; where money has been paid by innocent parties on fraudulent and void soldiers' and sailors' additional homestead entries; where entries were canceled for conflict; where entries are erroneously allowed and can not be confirmed; where applications to make entry, filing, selection, etc., are rejected; and where any amount has been paid in excess of the legal requirement. Under said laws there were stated during the last fiscal year 2,097 accounts, allowing repayment of $178,952.15, and during said period there were rejected 619 claims for repayment.

SURVEYING.

The second year of field operations under the direct system has developed the fact that the application of this system is successful in all cases. During the last fiscal year numerous reforms were inaugurated in the matters of accounting, purchases, progress reports, engaging assistants, and writing up of field work, which have been conducive to economy and expedition. The purchasing of animals, which was largely experimental in the first days of the new system, has been extended so as to embrace nearly all districts. The effect has been a marked reduction in the cost of surveys.

As a result of the civil-service examination of last year a list of over 70 eligibles was created, all of whom have been more or less experienced in public-land survey work, and have now received appointments as United States surveyors. This available force, with an additional number of temporary transitmen authorized by the commissioner, will be sufficient to handle such surveys as may be appropriated for during the fiscal year 1913.

Special appropriations and funds from railroad deposits enabled this office to have in the field on July 1, 1912, 87 parties. When the appropriations for 1913 are fully available the parties will be increased to the number at work last year.

The work of finishing the surveys embraced in contracts has proceeded rapidly and only a few contracts are now outstanding. They are those which upon examination required field correction and reformation of the entire survey.

In addition to the regular apportionments for surveys and special appropriations for surveys in stated localities there have been executed emergency surveys in cases of lands involved in suits brought by the Government. Surveys of abandoned military reservations have been made by this office preliminary to their disposal. Townsites and islands have been surveyed for disposition under the various land laws. This office is now considering a plan of cooperative surveys with the Forest Service, made necessary by the listing of lands within national forests, and plans are being considered whereby the burden of cost to the homesteader is lightened.

Extensive surveys have been in progress during the year of lands within Indian reservations, asked for by the Indian Office for purposes connected with allotments and subsequent opening of the lands to public entry. To further the proper selections for irrigation and other purposes upon Indian lands, this office, upon the request of the Indian Office, has executed, simultaneously with the regular subdivisional survey, a contour or topographic survey. The surveys are paid for out of special and general appropriations in the Indian appropriation bill.

The expense attending the execution of the above surveys has been gradually diminishing owing to the inauguration of business methods in the management of the field force in the matter of supplies and material and the system of rules adopted for guidance in grading of compensation and allowances. The expense of equipping this large force with proper astronomical instruments will in future be lessened, as their initial cost was a large factor in the total cost of surveying. The number of instruments now on hand is ample to equip all the parties which may be put in the field under present appropriations. The number of Government-owned animals and wagons now on hand bought from previous appropriations will also keep down the expense of future surveys.

The administrative work necessary to control and maintain the field and office work both in the office here and in the offices of the surveyors general, consequent upon the abolition of the contract system, has greatly increased. This emergency has been met by increases for clerk hire in the branch offices, so that the handling of the clerical part of the survey work is now rendered more prompt and the transmission of the completed returns to this office made much earlier after the surveyors have submitted their notes.

The necessary examination here of these returns before acceptance and the correspondence incident to a proper approval of instructions to the surveyors has multiplied the duties devolving upon the expert force in the Surveying Division of this office, so that the office has been unable to keep abreast of the reception of the returns, thus involving delays of several months after the complete record of field

notes has been forwarded by the surveyors general before a case can be reached. Congress has, however, granted this office a small increase of force, limited to the fiscal year 1913, for temporary service in bringing up the arrears of work upon returns of surveys and resurveys of public lands, and it is hoped that with this additional help the work will be brought up to date.

The number of acres surveyed during the fiscal year ended June 30, 1912, will be found in the statistical table in another part of the report.

ALASKA SURVEYS.

The work of subdivisional surveys in Alaska, which was suspended for the winter after about 200,000 acres had been surveyed by the six parties operating in the field, was resumed at the opening of the season in June, 1912, and is now (September) in progress, but the necessary preliminaries to the actual running of lines, such as the establishment of the camps and arranging for supplies, the identification of starting points, adjustment of instruments, and other essentials, were such as to render the output for the month of June inconsiderable.

One of the three localities selected for subdivision last season (Chitina) in the Copper River Valley was not occupied this season, as the 1911 surveys in this region covered the greater part of the lands which it was thought would be demanded for settlement and future entry.

The surveys in the Tanana Valley, with Fairbanks as central point, and those of the Susitna Valley, with Seward as a base of operations, were continued, and reports from the four parties engaged show gratifying progress.

In addition to the regular subdivisional work carried on through independent bases and meridians, according to the requirements of the rectangular system, a number of fragmentary surveys have been executed. These are isolated tracts, impracticable of connection with the groups of regular surveys, because remote from the above-mentioned centers, and varying in area from 1 acre to 320 acres each, yet surveyable under the laws and regulations pertaining to Alaska, provided for in the trade and manufactures, homesteads, soldiers' additional homesteads, and coal-land acts. The surveys in such cases were made by bonded surveyors, at the applicants' expense, subject to the approval of the Surveyor General and the supervision of this office.

The approval of about 25 of such surveys has been ordered during the fiscal year.

REESTABLISHMENT OF TEXAS-NEW MEXICO BOUNDARY.

At the date of the last report upon this work, which was authorized by Congress in a joint resolution approved February 16, 1911, the field work was completed and the surveyors were preparing their notes and plats.

During the last fiscal year the surveyors have worked up their notes and plats and the record consisting of bound volumes of typewritten field notes, photographs of monuments erected, duly attested,

and certified to by the commissioners on the part of the Government and Texas, have been submitted to the President for his action, looking to approval and forwarding to Congress. The submitted field notes were examined by this office and the reestablishment found to have been well executed and monumented with the corners and material prescribed in the instructions which were approved by the department and the President.

CAREY ACT.

It is not anticipated that the new applications for segregation received during the coming fiscal year will show an increase either in number or acreage. After the more thorough investigation by the State before filing an application for segregation, made possible by the act of March 15, 1910, permitting temporary withdrawal of the land, 19 projects for which such temporary withdrawal had been asked were abandoned and no applications for segregation filed for such projects. The temporary withdrawals have enabled this office to insist upon a more substantial compliance with the requirement that full data be furnished to show that the proposed plan of reclamation is feasible and sufficient. In applications filed by States without sufficient examination, it has sometimes developed upon field examination by representatives of this office that material modifications of the plan are necessary, entailing in some instances a reexamination in the field. In other cases projects submitted by the States have been found to be totally impracticable. It is expected that the States will more carefully examine projects before applying for segregation and will submit more adequate data with applications, thus expediting field examination and office adjudication.

Investigation of 31 projects having an aggregate area of over 1,000,000 acres has been directed. Fifteen applications for patent covering 208,995 acres have been transmitted to the field for investigation. In most of these investigations the field work has probably been completed or is nearing completion, and it is anticipated that the cases will be adjudicated during the current calendar year.

The near approach in many segregations of the expiration of the 10 years allowed within which to effect the reclamation of the land segregated and other information at hand indicate that the number of applications for patent during the coming fiscal year will show a marked increase. Many of these applications will be based upon segregations approved when the early practice of relying upon the representations of the States as to the sufficiency of the proposed plan of reclamation was followed. In these cases the investigation must be unusually complete. In all applications for patent the adequacy and permanency of the various reservoirs, canals, and structures must be fully considered. The sufficiency of the water supply after prior rights shall have been satisfied must be determined. The detail for investigations under the Carey Act of competent engineers in the field force has been continued. Thus, to their technical qualification has been added exceptional practical experience as irrigation engineers in the particular district to which they are assigned. This is of especial advantage not only in enabling them to accumulate the necessary data relative to stream flow, drainage area, and prior appropriations, but more particularly in determining the vexatious

question of water duty, in which determination the informed judgment of a qualified expert in the field is preferable to an office consideration of data, which, in the absence of actual results in the immediate vicinity, can never be complete enough to warrant more than a surmise. The general investigation, under departmental letters of June 17, 1912, of the results obtained under the Carey Act will not require the attention of the detailed engineers. This work will be done by ordinary agents.

With the increase in irrigation the determination of the amounts of water that may ultimately be diverted under rights initiated prior to the initiation of the rights relied upon for the project becomes of increasing importance. Care must be exercised to ascertain whether or not the claimed priority has been in any manner lost. Novel, intricate, and interesting but difficult questions depending on the varying laws relative to water rights obtaining in the several States are constantly presented for adjudication.

The joint resolution of August 21, 1911 (37 Stats., 38), made an additional million acres of land in Colorado subject to the provisions of the Carey Act.

By legislative act approved May 30, 1912, the State of Arizona accepted, subject to referendum, the grant under the Carey Act. The act accepting and providing for the administration of such grant, however, provides that it shall not apply, except to lands embraced within Indian reservations, until June 1, 1914. Accordingly no applications by Arizona will, in the absence of Federal legislation, be received in the coming fiscal year.

The international situation relative to the Colorado River will affect the administration of the Carey Act in parts of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming.

RESERVOIR DECLARATORY STATEMENTS.

All lands reserved under the provisions of the act of January 13, 1897 (29 Stat., 484), on which reservoirs have not been constructed within the two years allowed by the act have been restored to the public domain.

The department has held that a reservoir claimant under the act is not entitled to the maximum area allowed by the act, to wit, 160 acres, but only to sufficient land for the proper maintenance of the reservoir. It is therefore necessary to direct examinations in the field in order to ascertain the area absolutely necessary for the maintenance of such reservoirs. Such examinations require much time and are increasing in number. The work in connection with applications under this act, so far as the office force is concerned, is up to date.

RIGHTS OF WAY.

The work of investigation by the field force of easements and rights of way for irrigation, power, and other purposes, granted under the acts of March 3, 1891 (26 Stat., 1095), May 11, 1898 (30 Stat., 404), February 15, 1901 (31 Stat., 790), and February 1, 1905 (33 Stat., 628), where the period for construction has expired by limitation of law, has progressed steadily during the past year, and numerous cases have been reported where such easements and rights

of way are subject to forfeiture for nonconstruction during the statutory period. Appropriate action with a view to clearing the records of these unearned grants has been taken in a number of cases, and those remaining will be disposed of as rapidly as possible. In this connection it may be noted that this class of cases is a continuing one, new cases arising almost daily as the five-year periods for construction expire, and thus necessitates continued investigations in the field, followed by the office work necessary to clear the records where the grants are subject to cancellation or forfeiture.

POWER SITE, ETC., RESERVES.

Pursuant to the provisions of the act of June 25, 1910 (36 Stat., 847), there were 85 withdrawals for power-site purposes, involving 307,891.13 acres, and 19 restorations, aggregating 59,388.31 acres. There were also 6 withdrawals under the same act for public water reserves, covering 86,122 acres; 4 withdrawals under the act of June 25, 1910 (36 Stat., 855), embracing 73,096.62 acres, and 5 withdrawals, under the first mentioned act for various purposes, of 253,400 acres. The total area of the 100 withdrawals is 720,509.75 acres, of which 59,388.31 acres, embraced in 19 restorations, were relieved from reservation. There had previously been 196 withdrawals for power-site purposes, covering, on June 30, 1911, 1,510,647 acres, making the area withdrawn on June 30, 1912, after deducting the area restored, 2,231,156.75 acres. These lands are subject to all the provisions, limitations, exceptions, and conditions of the acts cited.

RAILROAD SELECTIONS.

The work in connection with the preparation of clear lists of railroad listings and selections for patent, because of the many withdrawals of lands for coal classification and with a view to their use for power-site and reservoir purposes, and the greater care exercised in their examination, reports being now required from the Geological Survey and special agents in the field before submitting them for approval, has become more complicated and onerous. And because of the comparatively small acreage of the lists, they now ranging from 40 to 1,000 acres each, when formerly it was common for them to contain 200,000 to 300,000 acres, the work, proportionately, of the field service as well as of this office has been greatly augmented. The field service especially feels the burden, the lands in the present small lists being frequently widely separated and requiring more travel and more time in their location; the former large lists lying in compact bodies much more easy of access and their character much more easy of determination.

STATE SELECTIONS.

During the fiscal year ended June 30, 1912, there were selections under the various State and Territorial grants approved to the amount of 181,280.62 acres. Selections were received for the year amounting to 249,443.17 acres. There were pending June 30, 1912, selections of this character aggregating 1,921,687.10 acres. Field examination or reports from the Geological Survey with respect to the

mineral character of the lands was had as to all selections prior to approval, and under a recent cooperative agreement with the Geological Survey excellent progress is being made in the examination and adjudication of selections of this class, upward of 77,000 acres of selections having been approved during the months of May and June.

In connection with congressional grants of lands to the various States and Territories, for educational and other purposes, reference was made in the last annual report to the fact that there was no provision of law whereby selections might be made in satisfaction of these grants, except under the Cary Act, for lands withdrawn or classified as coal lands, or valuable for coal, and recommendation was made that the provisions of the act of Congress approved June 22, 1910 (36 Stat., 583), be extended so as to remedy this condition. By act of Congress approved April 30, 1912 (Public, No. 141), the privileges contained in said act of June 22, 1910, are extended to the several States. Under this legislation large areas, which, though suitable, were theretofore unavailable for selection by reason of classification or withdrawal, are made subject to selection in aid of common schools, and in satisfaction of other State grants.

IMPERIAL VALLEY LANDS.

Conditions with respect to claims in the Imperial Valley of California are very satisfactory. Upward of 1,000 patents have been issued to entrymen where proper compliance with the provisions of the law, under which their claims were initiated, has been shown, and remaining claims are being adjudicated as speedily as possible.

SWAMP LANDS.

There were pending claims to swamp lands in place June 30, 1912, to the amount of 458,444.59 acres. New claims were reported during the year in favor of the several States to which the swamp-land grants have been extended, but principally in Florida, Minnesota, and Louisiana, amounting to 75,403.97 acres. This is about 30,000 acres in excess of the amount reported during the preceding year. The amount of swamp lands certified and patented was 26,932.15 acres, and claims to the amount of 10,125.16 were rejected and canceled. Thirty-nine contests against swamp-land claims were decided.

An important case, referred to in the last annual report, involving approximately 100,000 acres of land in the Palo Verde Valley, in Riverside and Imperial Counties, Cal., has been closed, and the claims of the State of California to said lands under the swamp-land grant finally rejected. These lands are rapidly being taken up by settlers and homeseekers.

ADJUSTMENT OF THE CALIFORNIA SCHOOL LAND GRANT.

The work devolving upon the General Land Office, under the basis of adjustment of June 16, 1911, is rapidly nearing completion. In May of this year a claim for payment in money was submitted to the

State under paragraph 1 of said basis of adjustment amounting to $22,431.50, and claims for land were submitted under paragraphs 3 and 4 aggregating 20,359.68 acres. The examination of the records of the State of California at Sacramento, rendered necessary in determining the amount of the claim under paragraph 2, was completed in July, and a final statement under this paragraph is now in course of preparation for submission to the State.

For the purpose of making field examinations of selected lieu lands, and for additional clerical assistance in the General Land Office in order that the reports as they come in from the field may be passed upon and the pending selections adjudicated promptly, an additional appropriation of $28,000 was requested from Congress. This amount has been granted, the appropriation being contained in the sundry civil act for the current year. This appropriation will be of material aid in bringing about a speedy adjustment and determination of the grant to the State.

SUNK LANDS AND LAKE LANDS IN ARKANSAS.

The policy of the department to the effect that these lands belong to the United States has been settled. The work connected with these cases during the past year has been that of surveying these lands in the field. During the fall and early winter of 1911 Government surveyors were at work, as the result of which all the so-called St. Francis River Sunk Lands proper, with the exception of five townships, were surveyed. The surveys of Buford, Walker, Clear, Flat, and Grassy Lakes have been completed in the field. Of the so-called lakes which have been declared to belong to the Government, but three now remain unsurveyed, namely, Hickory, Carson, and Tyronza. The plats of the five lakes referred to above will be ready for filing in the local land office at Little Rock about October 1, 1912, and it is hoped that the plats of the so-called St. Francis River Sunk Lands proper, with the exception of the five townships referred to above, will also be ready for filing during the present year.

It is the desire of this office to have the surveys in the field of the remaining unsurveyed lands completed during the fall and early winter. As soon as the plats are filed, it is expected that these lands will be thrown open to entry. Since the initial step was taken by the Government in claiming title to these lands, many persons have signified a desire to take up their homes on these lands and the result is that they are nearly all settled upon.

The Department of Justice has already taken steps with a view to the institution of suits to quiet title in the Government to said lands and as soon as the corrected plats of the surveys are filed, proceedings will be commenced.

During the fall of 1911, a hearing was held for the purpose of taking testimony to determine the question of title to so-called Big, Brown, and Round Lakes, which are alleged to be similar in character to the above-mentioned lakes. The department has not as yet rendered its decision with reference to the last-named lakes.

In the event that the Government succeeds in the proposed suits to quiet title, there may be considerable areas of other similar lands in the State of Arkansas with reference to which the question of title will have to be investigated by this office.

Recently the question of title relative to certain lands between the original meander and the actual present water's edge of so-called Ferry Lake, in the State of Louisiana, has arisen and investigations have been made under the supervision of this office. These lands are said to contain valuable deposits of coal and gas. The case originated through an application for survey, filed by certain placer mineral claimants. A decision will soon be rendered in this case.

Some time ago the department held that certain lands in so-called Black Lake, in Louisiana, were erroneously omitted from the original survey and therefore belong to the Government. It is possible that there are other lands within the meanders of so-called Black Lake and other lakes similarly circumstanced in the State of Louisiana which will require field investigation. In nearly all of these cases there are two classes of claimants who have endeavored to establish title adversely to the Government, namely, the riparian owners and the State, the latter generally claiming by virtue of the swamp-land grants. This class of work has increased considerably during the past few years and gives promise of requiring considerable attention on the part of this office in the future.

RECLAMATION WORK.

The reclamation work of the office has developed during the year, both in the number of existing entries and the number of questions arising in connection therewith. New legislation affecting entries within areas included in withdrawal under the reclamation act of June 17, 1902 (32 Stat., 388), has radically changed the status of many of these entries. During the year a new general circular covering this branch of the work has been issued, and as new legislation was enacted supplemental circulars have been prepared. The office has cooperated with the Reclamation Service in securing prompt action, and the local land officers having charge of lands within reclamation projects have been instructed as to the necessity of special action on water-right applications.

No new projects have been opened during the year, but in several projects new irrigation units have been covered by public notice, and numerous changes in irrigable areas have occurred, necessitating amendment of original farm unit plats.

Withdrawals of land under the reclamation act have been limited but large tracts have been released from withdrawal and restored to the public domain. The collection of water-right charges under the supervision of this office has been so handled as to reduce the number of delinquent water users to a very low minimum.

HOMESTEAD ENTRIES IN FOREST RESERVES.

Notices were issued during the past year, in accordance with the provisions of the act of June 11, 1906 (34 Stat., 233), in 1,828 lists, by which approximately 182,800 acres of agricultural lands in national forests were opened to settlement and entry under the homestead laws. Up to June 30, 1912, there have been restored to settlement and entry under this act approximately 786,150 acres. There are 1,600 lists still pending, which will be opened as fast as practic-

able, when an appropriation is available to pay the cost of advertising.

ABANDONED MILITARY RESERVATIONS.

During the past year there have been turned over to the department under the act of July 5, 1884 (23 Stat., 103), the following military reservations: The portion of Fort Grant, Ariz., about 12,160 acres, not included in the limits of the Crook National Forest by Executive order of August 10, 1911; the remainder of Fort Assiniboine, Mont., about 168,610 acres, by Executive order of November 20, 1911; Fort Niobrara, Nebr., about 60,000 acres, by Executive order of August 1, 1911; and Fort Brown, Tex., about 358.8 acres, by Executive order of October 14, 1911.

There is legislation pending relative to the method of disposing of Fort Grant, Fort Assinniboine, and Fort Niobrara, and on that account it is probable that there will be no disposal of lands in these reservations until next year. Fort Grant and Fort Assinniboine are not yet surveyed. A portion of Fort Brown, Tex., has been set aside by Executive order for experimental purposes by the Agricultural Department, and the remainder, as well as the Fort Ringgold, Tex., abandoned military reservation, have been surveyed and appraised with a view to their early disposal. Plans are under way to have Fort Grant and a portion of Fort Assinniboine surveyed as soon as funds are available.

LIEU SELECTIONS FOR LANDS IN INDIAN RESERVATIONS.

Under the act of April 21, 1904 (33 Stat., 211), which provided for an exchange by an owner of private land, over which an Indian reservation has been extended by Executive order, for vacant nonmineral, nontimber, surveyed public lands of equal area and value and situated in the same State or Territory, applications to select lands in exchange for private lands in the Zuni and Navajo Indian Reservations in New Mexico and the Moqui Indian Reservation in Arizona, have been filed to the extent of 460,204.30 acres. Patents have issued for 256,209.39 acres, and 30,200 acres have been approved for exchange by the Secretary of the Interior. The remaining 173,794.91 acres of tendered lands are now being examined looking to the question of exchange.

INDIAN ALLOTMENTS.

During the fiscal year ended June 30, 1912, 1,428 Indian allotments were received, 2,174 were disposed of by approval, and 3 by cancellation, leaving a total of 3,178 on hand at the close of the fiscal year.

INDIAN RESERVATION OPENINGS.

Registrations were held for the opening of lands in three Indian reservations during the year, at which the following number of applications were presented: For Fort Berthold lands in North Dakota, 20,504; for Rosebud and Pine Ridge lands in South Dakota, 53,728.

For the purpose of lessening the cost of these openings, both to the Indians and to the applicants, but one registration was held for the opening of the lands in the Rosebud Reservation and the Pine Ridge Reservation, although they were opened under separate acts of Congress.

The entries of these lands are now being made.

* * * * * * *

OPENING OF CHIPPEWA LANDS TO HOMESTEAD ENTRY.

After the last sale of October 21, 1911, there was unsold the timber on 20,173.25 acres outside of the Minnesota National Forest, the estimates showing that there were 19,718,000 feet on the lands, or less than 1,000 feet per acre. This timber was scattered and had been nearly all offered two or three times and not sold for want of bidders. The land has been looked over during the present summer with a view to its disposal to homesteaders under the act of June 25, 1910 (36 Stat., 862). Under this law the homestead entryman will be required to pay for the timber not less than the minimum price fixed by law at the time of making entry, and in addition thereto $1.25 per acre, as provided in section 6 of the act of January 14, 1889 (25 Stat., 642). It is the purpose to open to homesteaders next spring such of the lands as contain insufficient timber to attract bids from millmen.

NATIONAL FORESTS.

Since the issuance of the last annual report 22 national forests have been enlarged and 53 reduced under the act of June 4, 1897 (30 Stat., 34, 36), and 12 new administrative units have been formed by subdividing certain national forests, with additional areas from the public domain in some instances. The Garces National Forest has been consolidated with the Coronado National Forest, Arizona, and the Ocala and Choctawhatchee have been consolidated as the Florida National Forest, Florida. There are now 163 national forests, embracing 187,406,376 acres. The decrease in area of national forests since the beginning of the fiscal year is 3,201,867 acres.

During the fiscal year 3,440,252 acres have been excluded from the national forests by reclassification or otherwise, 2,497,840 acres thereof being within existing Indian reservations. The unappropriated public lands in 585,690 acres excluded during the fiscal year and in 112,728 acres excluded during the last fiscal year have been restored to settlement and entry. Areas temporarily withdrawn but not needed for forestry purposes are released from withdrawal upon the recommendation of the Secretary of Agriculture. Since the issuance of the last annual report 1,904,990 acres have been released from such withdrawal and the public lands therein opened to settlement and entry.

To protect possible power sites, all proclamations excluding public lands from the national forests since June 30, 1911, have contained a proviso withdrawing such lands for classification under the act of June 25, 1910 (36 Stat., 847), in order that prior to restoration thereof examination may be made and such of the lands as are found to be valuable for power may be withdrawn for that purpose.

During the fiscal year 29 stations, embracing 3,270 acres, have been withdrawn by Executive order, under the act of June 25, 1910 (36 Stat., 847), for use by the Forest Service in the administration of the national forests, and 21 withdrawals for such purpose have been revoked, covering 3,221 acres. There are now 24 rights of way for wagon roads and 3,991 administrative sites withdrawn, embracing 570,897 acres, 171 sites and 23,267 acres being near and 3,820 sites and 547,630 acres in the national forests.

NATIONAL MONUMENTS.

No new national monuments were created during the year, but the Navajo National Monument in Arizona, which reserved all ruins within a very large area, lying wholly within the Navajo Indian Reservation, was reduced by Executive order of March 14, 1912, to three small tracts containing in all 360 acres. Within these tracts are located large and very important prehistoric ruins. Upon the walls of one of these are plainly legible the inscriptions made by one of the earliest Spanish exploring parties in the Southwest.

After a careful survey of the originally reserved tract by Dr. G. P. Merrill, of the Smithsonian Institution, who was detailed for the purpose on request of this department, the Petrified Forest National Monument, in Arizona, by a second proclamation, dated July 31, 1911, was reduced in area from 60,776 acres to 25,625 acres. Within the reduced area two tracts have been designated for the collection of minor specimens of petrifactions by tourists and other visitors to the monument. This will be permitted under the supervision of the custodian in charge.

The national monument act of June 8, 1906 (34 Stat., 225), happily provided for the creation, by proclamation of the President, of certain classes of public reservations which theretofore had not been possible, except through acts of Congress. Many appeals had been made to create national parks, and many bills were introduced in Congress for that purpose which failed of passage. To secure a separate Federal statute was a cumbersome process, was rarely successful, and when successful was invariably accompanied by long delays. The monument law eliminated all of these difficulties, and appeals to its authority have thus far established 28 reservations. These are not only exceedingly popular where known, but are of very great value as standing public contributions to the world of science and art, to history and esthetics, to recreation, and to the general increase and diffusion of knowledge. They embrace the most extraordinary examples of forest growth; of caverns, canyons, and natural bridges; of lofty monoliths and of towering cliffs, on which the first words of American history were carved and are still legible; of the most remarkable series of cliff and plain communal dwellings of a prehistoric people not found elsewhere in the world, and near them the mission ruins of the earliest Spanish crusaders for church and spoil. All of these are certainly worthy of the fostering care of the Government. Those which are inaccessible should be made easily accessible and capable of exploration, examination, and study; and where possible the mission and prehistoric ruins should be restored by authority and under competent supervision. All monuments whose reserved objects are subject to plundering and ruin by

vandals or to unauthorized exploration by others need custodians on the ground.

The recommendations made during the several years past are most earnestly renewed—that an appropriation of at least $5,000 be submitted in the annual estimates and urged by the department for the preservation, development, administration, and protection of the national monuments, the same to be expended under the direction of the Secretary of the Interior.

BIRD RESERVATIONS.

During the fiscal year two bird reservations were enlarged and one slightly reduced in area, as follows:

The Cold Springs Reservation, Oreg., was enlarged November 25, 1911, by adding two small tracts, aggregating 160 acres.

The Minidoka Reservation, Idaho, was considerably enlarged February 21, 1912, because of the elevation of the flow line of the reservoir which extended, toward the lower end, over and far beyond the smaller legal subdivisions which bordered the reservoir as originally created.

The Clear Lake Reservation, Cal., on January 13, 1912, was reduced by 320 acres for administrative reasons. Within this smaller tract is located the dam site and the buildings of the official in charge, and the elimination embraced the narrow arm of the lake above and below the dam site.

Four new reservations were created, as follows:

The Niobrara Reservation, Nebr., January 11, 1912, containing nearly 23 square miles. This tract is a part of the abandoned Fort Niobrara military reservation, and the lands reserved are chiefly sand hills and rocky bluffs along the Niobrara River.

The Hazy Islands Reservation, created January 11, 1912, and the Forrester Islands Reservation, also created January 11, 1912, are both located in the Pacific Ocean, at the extreme southern extremity of Alaska. Both embrace small islands the areas of which are unknown.

The Green Bay Reservation, Wis., on February 21, 1912, containing 1.87 acres. This is a small island at the mouth of Green Bay, Wis.

There are now 56 bird reservations, which are distributed over the public-land States and insular possessions and extend from Porto Rico to Midway Islands, in the Pacific, eight being within Alaskan territory. A comparative estimate of the beneficial birds of the country was made by competent ornithologists about 16 years ago, and the report then made conclusively showed that all beneficial species, and these include game birds, nearly all of the birds of prey, and the insectivorous birds, were not only being seriously reduced in numbers, but in some cases were approaching extinction. The comparative number of beneficial birds of all species was found to have been reduced in the several States between 10 and about 75 per cent, as compared with conditions of 25 years before. The continuation of this appalling destruction promised disaster to agriculture, with its consequent effect upon the basic problem of human existence. Concerted effort was therefore at once directed, first, toward securing protective laws from the States and later the cooperation of the General Government.

The Federal bird reserve has become a universally recognized and heartily approved institution. It is opposed only by those who transform the living plume into the millinery monstrosity and temporarily profit by the tremendous sacrifice.

No other form of Government reserve more greatly concerns the general welfare than the bird reserve, because the successful administration of no other is so intimately associated with the food supply. The abandonment of national parks, forest, military, naval, lighthouse, and all other similar reservations would in no degree affect the crops of the farmer, nor would an increase in the number or area of such reserves reduce the cost of living, but the protection of the breeding grounds of the game birds, both of the land and water, means more and a greater variety of food; the protection and multiplication of the vermin and insect destroying birds means more certain crops and greater crops.

Thus far official administrative effort has been wholly inadequate because of a lack of funds. In fact, but for the active cooperation of a volunteer and unofficial body—the National Association of Audubon Societies, which spends thousands of dollars annually in its effort to create public sentiment in favor of bird protection and added thousands in making the underpaid and unpaid official warden service on bird reserves effective, the protection afforded the birds on many Government reserves would be wholly ineffective. Two bird wardens in Florida have been killed by plume hunters, one being shot in the back while engaged in the discharge of his official duties.

LEGISLATION.

THREE-YEAR HOMESTEAD.

Of new legislation since the last annual report the most important is the so-called "Three-year homestead bill." On June 6, 1912, the President approved the act which is known as the "Three-year homestead bill." Instructions have been issued under this act, and reports received from the field indicate that during the coming year the work of the local land offices and of the General Land Office, in Washington, will be very much augmented. There are in the public-land States over 300,000 homestead entries, upon which proof in the neighborhood of 50,000 will be made under the old law during this fiscal year. This would leave about 250,000, and of that number in the neighborhood of 100,000 will probably be affected by the new law. Estimates have been made, and the most conservative judgment is that at least 50,000 proofs, in addition to those which would ordinarily be offered, will be made during the coming year under the terms of the three-year homestead bill. If this estimate should be correct, and at the present writing it seems to be very conservative, this office will have over twice as much work in this line as it had last year.

With the additional help which Congress has provided it is hoped that the work can be kept abreast. If the actual number of proofs offered should exceed the estimate of 50,000, then the office will necessarily fall behind with the additional help provided.

RECLAMATION ENTRIES AND WATER-RIGHT CHARGES.

On August 9, 1912, an act was approved providing for the issuance of patent reserving a first lien to the United States for unpaid water-right charges on all entries where proof of compliance with the homestead law and a showing of reclamation is made. Final water-right certificate is also provided for on private water-right contracts upon a showing of reclamation and payment of accrued charges. This legislation serves to remove restrictions on the development of lands within reclamation projects.

This same act also authorizes the designation of bonded officers of the Reclamation Service on the several projects to collect water-right charges, transferring the supervision of such collection from the Commissioner of the General Land Office to the Director of the Reclamation Service. The location of collecting officers on the projects, rather than at local land offices frequently many miles distant, will prove a convenience to the water users.

PLACER MINING CLAIMS IN ALASKA.

August 1, 1912, Congress passed an act modifying and amending the mining laws in their application to Alaska. The act has no application whatever to lode claims and applies only to placer mining claims located in Alaska on or after August 1, 1912. This act contains several important amendments relating to the placer mining claims located in Alaska on or after August 1, 1912, namely: The limitation of an association placer to a maximum of 40 acres, the clause which shortens the length of time in which to commence to develop said placers by requiring that annual labor or "assessment work" shall also be performed during the year in which such placer mining claims were located, and the provisions which limits the number of placer locations which may be made through the use of powers of attorney. There is also a restriction upon the number of placer mining claims that may be located in any calendar month by power of attorney. The act also deals with the shape of such placer by providing that it can not be patented where it is "longer than three times its greatest width," or contains a greater area than is fixed by law, and, finally, the act provides in section 5, that any placer mining claim attempted to be located in violation of the act shall be null and void, and the whole area thereof may be located by any qualified locator as if no such prior attempt had been made

RECOMMENDATIONS.

REGULATION OF PROFESSIONAL LOCATORS AND PERNICIOUS LITERATURE IN RELATION TO PUBLIC LANDS.

The last annual report of this office conveyed a recommendation in behalf of legislation whereby to regulate the practices of professional locators or those persons who offer for hire or reward paid to them in that behalf to locate settlers and entrymen upon desirable tracts of public lands. Owing to the frequency and the seriousness of the complaints received in this office, revealing the injurious consequences and grievous hardships suffered by persons who have sought homes on the public domain, resulting from the ignorant or willful decep-

tion practiced by persons employed and paid to secure for them satisfactory locations, it is believed that the subject is well worthy of congressional attention, and for this reason the recommendation of the former report is respectfully and most earnestly renewed, in the hope that it will not be unnoticed.

It is also desirable in this connection to invite attention to the pernicious consequences resulting from the use of the United States mails for the purpose of distributing false and misleading circulars, pamphlets, cards, and other advertising matter in relation to the inducements and contemplations offered to settlers by the public lands in localities therein described and concerning the rights and privileges of settlers upon and entrymen of public lands in those localities. It is not intended thus to refer to news items and contributions appearing in magazines and newspapers, nor is it proposed to condemn the very usual and altogether to be expected laudation in which local "boomers" commonly indulge. What are intended to be reprobated, however, are those publications prepared, published, and distributed by persons, firms, and corporations engaged in and intending to be profited by inducing settlement on public lands in such localities as they have selected for their operation, in and by which such publications, statements, and representations are made concerning the purposes of the Government in relation to the lands therein mentioned or concerning the legal rights and privileges of settlers upon and entrymen of those lands, such statements or representations being ignorantly or knowingly false and deceptive.

The attention of this office has frequently been invoked to literature of this character, the object of which, as clearly revealed therein, is to induce receivers thereof to make remittances to the persons responsible for the publication as payment or partial payment for services to be rendered by such person in securing the remitter a location upon or entry of some tract of land in a described vicinity, or to induce him to visit the locality in question and there employ and pay that person for his services in effecting such location or entry.

It is believed that this matter should also receive congressional consideration and be the subject of some appropriate legislation whereby to enlarge and extend the scope of the present laws governing the use of the United States mails in the promotion of fraudulent purposes, or by which to provide some other adequate means of regulation and restraint. It may not be inappropriate and impracticable to require publications of this character to be submitted to and receive the sanction of this department in so far as they attempt to define the legal status of the lands to which they relate or the operation and effect of the laws governing their disposition.

* * * * * * *

CERTIFIED COPIES OF RECORDS IN SURVEYORS GENERAL OFFICES AND LOCAL LAND OFFICES.

The Comptroller of the Treasury, by his decision of September 17, 1912, has held that moneys received for exemplified copies of plats and other records by Surveyors General must be deposited in the Treasury of the United States to the credit of the fund of "Miscellaneous receipts." By so depositing such moneys they are not available for the payment of the expenses of making such copies, for which work no other fund is available.

The act of August 24, 1912 (Public, No. 302), provides, in part, that moneys received by all offices under the Interior Department for making certified copies of official records must be deposited to the fund of "Miscellaneous receipts."

The circular of November 22, 1909 (38 L. D., 312), to registers and receivers and United States Surveyors General contains the following paragraph:

> When certified copies of records are requested and the pressure of public business will not permit of the work being done by the office force, the parties desiring same, if desk room is available, may be permitted to make such copies, but before certification by you copies thus made must be carefully compared by your office and you will charge therefor the fees allowed by law.

Public policy demands that these copies should be furnished, especially as they are largely for the benefit of applicants and prospective applicants for portions of the public domain, and it is a hardship on the part of applicants for copies who do not reside in the same town where the office containing the records is situated to refuse to furnish them the copies requested, as it would entail considerable expense upon them to send persons to such office to make the desired copies. As far as copies of local land office records are concerned, it is recommended that an additional appropriation of $25,000 be requested to employ the necessary clerical help in those land offices where it is impossible under the pressure of ordinary business for the present clerical force to make these copies.

In the offices of the surveyors general it seems that most of the copies requested to be made in those offices are those pertaining to mineral surveys, although a considerable portion are in connection with agricultural and other surveys. The best solution, to my mind, of the problem which presents itself in view of the comptroller's decision of September 17, 1912, above alluded to, which would prohibit employees paid from the fund of "Deposits by individuals for surveying public lands" from making copies, is to have enacted into law a provision which would call for the deposit of moneys paid to surveyors general by applicants for exemplified copies of records and plats in the offices of surveyors general, to the credit of the Treasurer of the United States to the fund of "Deposits by individuals for surveying public lands," and the same to be available for the payment of the compensation of the clerks and others engaged in such work, and in payment for the stationery and office supplies used in such work, provision being made that specific authorization by the Commissioner of the General Land Office must be obtained before any expense chargeable to such fund shall be incurred for clerk hire and incidental expenses by the respective surveyors general in the conduct of their offices.

A provision of this kind has been inserted in the annual estimates of the appropriations for this office, following the estimates for salaries and contingent expenses in the office of the surveyors general for the fiscal years 1910, 1912, and 1913, without favorable action on the part of Congress.

Without repeating the individual items recommended for legislative enactment in the last annual report, reference is respectfully made to said report (pp. 43 and 44), in which needed legislation is summarized.

Very respectfully, FRED DENNETT, *Commissioner.*

STATISTICS RELATING TO THE DISPOSITION OF THE PUBLIC DOMAIN.

Area of States and Territories.

[Based upon careful joint calculations made in the General Land Office, the Geological Survey, and the Bureau of the Census.]

State or Territory.	Land surface.		Water surface.		Total areas.	
	Sq. m.	*Acres.*	*Sq. m.*	*Acres.*	*Sq. m.*	*Acres.*
Alabama	51,279	32,818,560	719	460,160	51,998	33,278,720
Arizona	113,810	72,838,400	146	93,440	113,956	72,931,840
Arkansas	52,525	33,616,000	810	518,400	53,335	34,134,400
California	155,652	99,617,280	2,645	1,692,800	158,297	101,310,080
Colorado	103,658	66,341,120	290	185,600	103,948	66,526,720
Connecticut	4,820	3,084,800	145	92,800	4,965	3,177,600
Delaware	1,965	1,257,600	405	259,200	2,370	1,516,800
District of Columbia	60	38,400	10	6,400	70	44,800
Florida	54,861	35,111,040	3,805	2,435,200	58,666	37,546,240
Georgia	58,725	37,584,000	540	345,600	59,265	37,929,600
Idaho	83,354	53,346,560	534	341,760	83,888	53,688,320
Illinois	56,043	35,867,520	622	398,080	56,665	36,265,600
Indiana	36,045	23,068,800	309	197,760	36,354	23,266,560
Iowa	55,586	35,575,040	561	359,040	56,147	35,934,080
Kansas	81,774	52,335,360	384	245,760	82,158	52,581,120
Kentucky	40,181	25,715,840	417	266,880	40,598	25,982,720
Louisiana	45,409	29,061,760	3,097	1,982,080	48,506	31,043,840
Maine	29,895	19,132,800	3,145	2,012,800	33,040	21,145,600
Maryland	9,941	6,362,240	2,386	1,527,040	12,327	7,889,280
Massachusetts	8,039	5,144,960	227	145,280	8,266	5,290,240
Michigan	57,480	36,787,200	500	320,000	57,980	37,107,200
Minnesota	80,858	51,749,120	3,824	2,447,360	84,682	54,196,480
Mississippi	46,362	29,671,680	503	321,920	46,865	29,993,600
Missouri	68,727	43,985,280	693	443,520	69,420	44,428,800
Montana	146,201	93,568,640	796	509,440	146,997	94,078,080
Nebraska	76,808	49,157,120	712	455,680	77,520	49,612,800
Nevada	109,821	70,285,440	869	556,160	110,690	70,841,600
New Hampshire	9,031	5,779,840	310	198,400	9,341	5,978,240
New Jersey	7,514	4,808,960	710	454,400	8,224	5,263,360
New Mexico	122,503	78,401,920	131	83,840	122,634	78,485,760
New York	47,654	30,498,560	1,550	992,000	49,204	31,490,560
North Carolina	48,740	31,193,600	3,686	2,359,040	52,426	33,552,640
North Dakota	70,183	44,917,120	654	418,560	70,837	45,335,680
Ohio	40,740	26,073,600	300	192,000	41,040	26,265,600
Oklahoma	69,414	44,424,960	643	411,520	70,057	44,836,480
Oregon	95,607	61,188,480	1,092	698,880	96,699	61,887,360
Pennsylvania	44,832	28,692,480	294	188,160	45,126	28,880,640
Rhode Island	1,067	682,880	181	115,840	1,248	798,720
South Carolina	30,495	19,516,800	494	316,160	30,989	19,832,960
South Dakota	76,868	49,195,520	747	478,080	77,615	49,673,600
Tennessee	41,687	26,679,680	335	214,400	42,022	26,894,080
Texas	262,398	167,934,720	3,498	2,238,720	265,896	170,173,440
Utah	82,184	52,597,760	2,806	1,795,840	84,990	54,393,600
Vermont	9,124	5,839,360	440	281,600	9,564	6,120,960
Virginia	40,262	25,767,680	2,365	1,513,600	42,627	27,281,280
Washington	66,836	42,775,040	2,291	1,466,240	69,127	44,241,280
West Virginia	24,022	15,374,080	148	94,720	24,170	15,468,800
Wisconsin	55,256	35,363,840	810	518,400	56,066	35,882,240
Wyoming	97,594	62,460,160	320	204,800	97,914	62,664,960
	2,973,890	1,903,289,600	52,899	33,855,360	3,026,789	1,937,144,960
Alaska					590,884	378,165,760
Guam					210	134,400
Hawaii					6,449	4,127,360
Panama Canal strip					436	279,040
Philippine Islands					115,026	73,616,640
Porto Rico					3,435	2,198,400
Tutuila Group, Samoa					77	49,280
Total					3,743,306	2,395,715,840

Owing to their location adjoining the Great Lakes, the States enumerated below contain approximately an additional number of square miles as follows: Illinois, 1,674 square miles of Lake Michigan; Indiana, 230 square miles of Lake Michigan; Michigan, 16,653 square miles of Lake Superior, 12,922 square miles of Lake Michigan, 9,925 square miles of Lake Huron, and 460 square miles of lakes St. Clair and Erie; Minnesota, 2,514 square miles of Lake Superior; New York, 3,140 square miles of lakes Ontario and Erie; Ohio, 3,443 square miles of Lake Erie; Pennsylvania, 891 square miles of Lake Erie; Wisconsin, 2,378 square miles of Lake Superior and 7,500 square miles of Lake Michigan.

In addition to the water areas noted above, California claims jurisdiction over all Pacific waters lying within 3 English miles of her coast; Oregon claims jurisdiction over a similar strip of the Pacific Ocean 1 marine league in width between latitude 42° north and the mouth of the Columbia River; and Texas claims jurisdiction over a strip of Gulf water 3 leagues in width, adjacent to her coast and between the Rio Grande and the Sabine River.

United States district land offices.

Locations.	Established.	Opened.
Alabama:		
Montgomery	July 10,1832	Jan. 1,1834
Alaska:		
Fairbanks	May 14,1907	July 1,1907
Juneau	Apr. 2,1902	June 20,1902
Nome	May 14,1907	July 1,1907
Arizona:		
Phoenix	July 25,1905	Oct. 2,1905
Arkansas:		
Camden	Jan. 10,1871	Mar. 20,1871
Harrison	July 14,1870	Feb. 27,1871
Little Rock	Feb. 17,1818	Sept. 1,1821
California:		
Eureka	Mar. 29,1858	July 24,1858
Independence	Apr. 22,1886	Mar. 22,1887
Los Angeles	June 12,1869	Sept. 22,1869
Redding	May 13,1890	July 15,1890
Sacramento	July 26,1866	Nov. 12,1867
San Francisco	Mar. 4,1911	May 1,1911
Susanville	Feb. 10,1871	Mar. 2,1871
Visalia	Mar. 29,1858	July 10,1858
Colorado:		
Del Norte	June 20,1874	Mar. 22,1875
Denver	June 4,1864	Aug. 15,1864
Durango	Apr. 20,1882	Oct. 2,1882
Glenwood Springs	July 3,1884	Nov. 10,1884
Hugo	Feb. 6,1890	Sept. 7,1890
Lamar	Aug. 4,1886	Jan. 3,1887
Leadville	Apr. 5,1879	July 1,1879
Montrose	Jan. 4,1888	Sept. 1,1888
Pueblo	May 27,1870	Jan. 16,1871
Sterling	Feb. 6,1890	Aug. 1,1890
Florida:		
Gainesville	June 8,1872	Apr. 30,1873
Idaho:		
Blackfoot	Sept. 3,1886	Nov. 16,1886
Boise	July 26,1866	Jan. 13,1868
Coeur d'Alene	July 14,1884	Dec. 21,1885
Hailey	Jan. 24,1883	July 16,1883
Lewiston	July 26,1866	Sept. 26,1871
Kansas:		
Dodge City	Dec. 20,1893	Feb. 3,1894
Topeka	July 24,1861	Sept. 10,1861
Louisiana:		
Baton Rouge	Jan. 6,1911	Apr. 1,1911
Michigan:		
Marquette	Mar. 19,1857	July 14,1857
Minnesota:		
Cass Lake	Apr. 1,1903	July 1,1903
Crookston	Apr. 29,1878	May 5,1879
Duluth	Mar. 27,1862	Jan. 15,1863
Mississippi:		
Jackson	June 23,1836	July 25,1836
Missouri:		
Springfield	June 26,1834	Oct. 4,1838
Montana:		
Billings	Feb. 5,1906	July 2,1906
Bozeman	June 20,1874	Oct. 5,1874
Glasgow	Feb. 25,1907	June 1,1907
Great Falls	May 8,1902	Aug. 1,1902
Havre	Mar. 15,1910	July 1,1910
Helena	Mar. 2,1867	Apr. 27,1867
Kalispell	Mar. 2,1897	July 1,1897
Lewistown	Apr. 1,1890	Nov. 26,1890
Miles City	Apr. 30,1880	Oct. 19,1880
Montana—Contd.		
Missoula	Apr. 1,1890	Apr. 20,1891
Nebraska:		
Alliance	Apr. 16,1890	July 1,1890
Broken Bow	do	July 7,1890
Lincoln	July 7,1868	Sept. 7,1868
North Platte	Apr. 22,1872	Apr. 11,1873
O'Neill	Apr. 7,1888	July 16,1888
Valentine	June 19,1882	July 7,1883
Nevada:		
Carson City	July 2,1862	Mar. 1,1864
New Mexico:		
Clayton	Dec. 18,1888	Aug. 12,1889
Fort Sumner	June 22,1910	Oct. 1,1910
Las Cruces	Mar. 10,1883	May 1,1883
Roswell	Mar. 1,1889	Dec. 9,1889
Santa Fe	May 24,1858	Nov. 24,1858
Tucumcari	Mar. 16,1908	July 1,1908
North Dakota:		
Bismarck	Apr. 24,1874	Oct. 12,1874
Devils Lake	Mar. 3,1883	Aug. 24,1883
Dickinson	Mar. 16,1904	July 1,1904
Fargo	Dec. 29,1873	Sept. 1,1874
Minot	Sept. 26,1890	Oct. 1,1891
Williston	Apr. 26,1906	Aug. 1,1906
Oklahoma:		
El Reno	July 4,1901	Aug. 6,1901
Guthrie	Mar. 3,1889	Apr. 22,1889
Woodward	Aug. 25,1893	Sept. 16,1893
Oregon:		
Burns	June 1,1889	Sept. 2,1889
La Grande	July 3,1866	Nov. 15,1867
Lakeview	June 6,1877	Aug. 6,1877
Portland	Aug. 24,1854	Jan. 1,1855
Roseburg	Sept. 15,1859	Jan. 3,1860
The Dalles	Jan. 11,1875	June 1,1875
Vale	Mar. 15,1910	July 1,1910
South Dakota:		
Timber Lake	Feb. 12,1911	May 1,1911
Bellefourche	Feb. 6,1909	July 1,1909
Chamberlain	Feb. 10,1890	Apr. 3,1890
Gregory	July 14,1880	Jan. 3,1882
Lemmon	May 29,1908	Aug. 1,1908
Pierre	Feb. 10,1890	May 12,1890
Rapid City	Dec. 13,1888	Jan. 15,1889
Utah:		
Salt Lake City	July 16,1868	Nov. 1,1868
Vernal	May 9,1905	July 1,1905
Washington:		
North Yakima	Apr. 11,1885	Apr. 24,1885
Olympia	May 16,1890	Oct. 1,1890
Seattle	June 27,1887	Dec. 3,1887
Spokane	June 23,1883	Oct. 1,1883
Vancouver	May 16,1860	July 3,1861
Walla Walla	Mar. 3,1871	July 17,1871
Waterville	May 16,1890	Nov. 6,1890
Wisconsin:		
Wausau	June 19,1872	Aug. 19,1872
Wyoming:		
Buffalo	Mar. 3,1887	May 1,1888
Cheyenne	Feb. 5,1870	Aug. 10,1870
Douglas	Apr. 23,1890	Nov. 1,1890
Evanston	Aug. 9,1876	Aug. 13,1877
Lander	Apr. 23,1890	Nov. 8,1890
Sundance	Apr. 3,1890	Oct. 27,189

NOTE.—The land offices in Ohio, Indiana, Illinois, and Iowa are abolished, and the vacant tracts of public lands in those States are subject to entry and location at the General Land Office, Washington, D. C.

List of offices of United States surveyors general.

Locations.	Established.	Locations.	Established.
Alaska: Juneau	May 17, 1884	New Mexico: Santa Fe	Mar. 2, 1867
Arizona: Phoenix	Feb. 24, 1863	Oregon: Portland	July 17, 1854
California: San Francisco	Mar. 3, 1851	South Dakota: Huron	Apr. 10, 1890
Colorado: Denver	Feb. 28, 1861	Utah: Salt Lake City	July 16, 1868
Idaho: Boise	June 29, 1866	Washington: Olympia	July 17, 1854
Montana: Helena	July 2, 1864	Wyoming: Cheyenne	Feb. 5, 1870
Nevada: Reno	July 4, 1866		

Field division headquarters of special agents of General Land Office.

Field division:	Field division—Continued.
1.....Portland, Oreg.	7.....Cheyenne, Wyo.
2.....San Francisco, Cal.	8.....Duluth, Minn.
3.....Seattle, Wash.	9.....Little Rock, Ark.
4.....Helena, Mont.	10.....Salt Lake City, Utah.
5.....Denver, Colo.	11.....Gainesville, Fla.
6.....Los Angeles, Cal.	12.....Santa Fe, N. Mex.

Average number of employees of the General Land Office.

In General Land Office, Washington, D. C	532
In 13 offices of surveyors general	174
In 102 district land offices	414
In the field service	180
In the surveying service	102
In logging service	17
Total	1,419

Final homestead entries from the passage of the homestead act to June 30, 1912.

Fiscal year ended June 30—	Number.	Acres.	Fiscal year ended June 30—	Number.	Acres.
1868	2,772	355,086.04	1892	22,822	3,259,897.07
1869	3,965	504,301.97	1893	24,204	3,477,231.63
1870	4,041	519,727.84	1894	20,544	2,929,947.41
1871	5,087	629,162.25	1895	20,922	2,980,809.30
1872	5,917	707,409.83	1896	20,099	2,790,242.55
1873	10,311	1,224,890.93	1897	20,115	2,778,404.20
1874	14,129	1,585,781.56	1898	22,281	3,095,017.75
1875	18,293	2,068,537.74	1899	22,812	3,134,140.44
1876	22,530	2,590,552.81	1900	25,286	3,477,842.71
1877	19,900	2,407,828,19	1901	37,568	5,241,120.76
1878	22,460	2,662,980.82	1902	31,627	4,342,747.70
1879	17,391	2,070,842.39	1903	26,373	3,576,964.14
1880	15,441	1,938,234.89	1904	23,932	3,232,716.75
1881	15,077	1,928,204.76	1905	24,621	3,419,387.15
1882	17,174	2,219,453.80	1906	25,546	3,526,748.58
1883	18,998	2,504,414.51	1907	26,485	3,740,567.71
1884	21,843	2,945,574.72	1908	29,636	4,242,710.59
1885	22,066	3,032,679.11	1909	25,510	3,699,466.79
1886	19,356	2,663,531.83	1910	23,253	3,795,862.89
1887	19,866	2,749,037.48	1911	25,908	4,620,197.12
1888	22,413	3,175,400.64	1912	24,326	4,306,068.52
1889	25,549	3,681,708.80			
1890	28,080	4,060,592.77	Total	924,215	127,846,424.21
1891	27,686	3,954,587.77			

Timber and stone entries from the passage of the act of June 3, 1878, to June 30, 1912.

States or Territories.	Number of entries.	Acres.	Amount received.	States or Territories.	Number of entries.	Acres.	Amount received.
Alabama	258	20,839.34	$55,950.30	Nebraska	1	97.20	$243.00
Arizona	3	200.00	500.00	Nevada	49	6,222.32	15,558.19
Arkansas	2,131	292,336.48	588,116.96	North Dakota	81	8,566.90	21,807.25
California	19,680	2,776,019.27	6,980,338.43	Oklahoma	1	40.00	100.00
Colorado	2,747	339,836.29	859,717.04	Oregon	25,739	3,675,835.19	9,287,637.01
Florida	851	97,181.65	264,906.11	South Dakota	529	58,384.78	149,028.31
Idaho	7,197	969,164.14	2,492,714.54	Utah	21	2,121.21	4,993.09
Iowa	3	119.36	298.40	Washington	15,856	2,109,786.07	5,322,752.02
Louisiana	1,541	136,683.61	338,175.55	Wisconsin	1,060	77,854.67	195,111.45
Michigan	1,594	132,774.97	335,502.45	Wyoming	3,259	368,967.77	909,224.04
Minnesota	12,085	1,362,639.74	3,427,642.23				
Mississippi	80	5,795.82	14,512.19	Total	99,535	13,059,658.06	32,839,932.56
Montana	4,769	618,191.28	1,575,104.00				

Desert-land entries from the passage of the act of Mar. 3, 1877, to June 30, 1912.

States or Territories.	Entries.		Area.		Amount.		
	Original.	Final.	Original.	Final.	Original.	Final.	Total.
			Acres.	*Acres.*			
Arizona	6,606	901	1,928,879.91	246,392.88	$484,784.59	$280,234.05	$765,018.64
California	16,366	2,813	3,758,628.74	560,468.96	954,692.21	583,538.67	1,538,230.88
Colorado	15,218	2,311	2,860,387.82	405,161.34	715,688.95	405,005.46	1,120,694.41
Dakota Territory	35	1	20,021.00	300.00	5,005.25	300.00	5,305.25
Idaho	15,157	3,134	2,644,391.05	714,473.88	660,777.24	667,986.14	1,373,863.38
Montana	28,619	10,990	5,466,749.01	2,106,224.27	1,372,485.38	2,119,090.12	3,491,575.50
Nevada	1,690	234	394,684.53	53,152.54	98,910.82	53,085.41	151,996.23
New Mexico	10,126	1,184	1,967,053.90	167,801.52	493,592.72	267,415.45	761,008.17
North Dakota	514	101	84,958.51	16,937.15	21,241.09	17,001.89	38,242.98
Oregon	5,655	1,229	972,314.40	207,530.18	242,774.84	206,475.09	449,249.93
South Dakota	3,749	376	571,483.25	65,592.33	142,190.44	65,752.27	207,942.71
Utah	7,089	1,858	1,259,744.54	303,361.90	321,715.71	309,160.73	630,876.44
Washington	5,350	439	898,993.41	47,718.64	235,689.20	61,468.12	297,157.32
Wyoming	15,445	5,376	3,456,295.02	1,203,391.32	870,866.88	1,212,082.74	2,082,949.62
Total	131,518	31,947	26,104,585.09	6,218,509.91	6,620,416.12	6,261,237.53	12,881,653.65

Timber-culture entries from the passage of the act of Mar. 3, 1873, to June 30, 1912.

States or Territories.	Entries.			Area.			Amount.			
	Original.	Final.	Commuted.	Original.	Final.	Commuted.	Fees (original).	Fees (final).	Purchase money.	Total.
				Acres.	*Acres.*	*Acres.*				
Arizona	1,152	52	74	164,806.63	7,149.14	10,223.42	$15,224.00	$208.00	$12,779.26	$28,211.26
Arkansas	41	4	1	4,817.14	480.00	40.00	489.00	16.00	44.00	549.00
California	8,264	480	567	1,163,922.03	63,411.58	78,728.76	110,014.00	1,904.00	98,499.13	210,417.13
Colorado	27,864	3,789	660	4,332,922.19	585,243.30	98,179.52	384,938.00	15,154.00	122,722.36	522,814.36
Dakota Territory	77,446	1,369	.....	12,055,642.98	185,467.24	.....	1,074,862.44	4,984.79	.....	1,079,847.23
Florida	3	.....	.....	480.00	.....	.....	42.00	.....	.....	42.00
Idaho	4,054	341	236	533,957.49	40,436.03	28,244.51	51,447.38	1,369.50	35,305.93	88,122.81
Iowa	1,044	390	39	81,378.95	31,987.87	2,202.17	11,838.83	1,560.00	2,965.22	16,364.05
Kansas	64,345	12,886	961	9,702,653.36	2,005,831.35	142,931.88	883,275.56	51,529.03	178,050.55	1,113,455.14
Louisiana	713	87	42	101,695.31	11,937.97	5,856.85	9,651.55	348.00	7,299.54	17,299.09
Minnesota	15,268	2,924	389	2,099,046.55	373,580.90	40,261.29	207,154.98	11,712.00	61,543.77	280,410.75
Montana	3,595	407	225	486,638.66	56,019.73	29,044.43	46,162.00	1,632.00	36,506.32	84,300.32
Nebraska	59,127	16,870	1,250	8,876,351.20	2,546,696.04	187,371.35	813,382.33	67,776.73	234,332.61	1,115,491.67
Nevada	46	1	.....	6,292.50	160.00	.....	614.00	4.00	.....	618.00
New Mexico	1,612	91	55	230,316.54	12,931.60	7,837.25	21,294.00	363.00	9,796.56	31,453.56
North Dakota	1,699	7,897	781	263,123.95	1,226,605.66	120,524.80	23,446.00	31,576.83	150,661.75	205,684.58
Oregon	7,126	1,502	252	1,051,235.21	224,545.60	35,902.61	95,821.00	6,028.00	44,878.37	146,721.37
South Dakota	2,925	13,764	821	449,583.61	2,124,753.58	121,730.98	40,151.00	55,036.00	152,082.89	247,269.89
Utah	1,476	138	89	179,690.74	15,556.26	10,157.44	17,925.00	552.00	12,696.85	31,173.85
Washington	9,354	2,006	538	1,362,193.51	292,727.52	75,689.54	125,615.00	8,020.00	94,770.83	228,405.83
Wisconsin	1	1	.....	40.00	40.00	.....	9.00	4.00	.....	13.00
Wyoming	3,123	332	125	459,556.42	50,383.08	15,288.29	41,904.00	1,328.00	19,135.91	62,367.91
Total	290,278	65,263	7,105	43,606,344.97	9,855,944.45	1,010,305.09	3,975,261.07	261,105.88	1,274,671.85	5,511,032.80

Coal-land entries from the passage of the act of Mar. 3, 1873, to June 30, 1912.

States or Territories.	Entries.	Acres.	Amount.	States or Territories.	Entries.	Acres.	Amount.
Alabama	2	239.40	$2,394.00	New Mexico	198	23,349.22	$367,097.40
Alaska [1]	159	37,011.81	370,118.58	North Dakota	131	7,891.71	119,442.40
Arizona	24	3,828.39	46,283.90	Oregon	57	9,043.33	96,140.30
California	38	5,535.06	81,531.30	South Dakota	38	2,593.74	28,737.40
Colorado	1,026	154,442.72	2,165,697.20	Utah	409	58,248.73	1,259,249.75
Colorado [2]	433	56,786.77	840,838.90	Washington	364	57,047.76	895,210.20
Dakota [3]	8	583.57	5,835.70	Wyoming	708	102,666.83	2,004,793.86
Idaho	9	2,002.84	20,031.80				
Montana	372	54,328.37	951,304.90	Total	3,982	576,280.36	9,263,109.79
Nevada	6	680.11	8,402.20				

[1] The showing of 159 "entries" in this table includes locations on which final certificates have issued and those on which payment has been made but for which receiver's receipt only has issued. There are only 35 coal claims in Alaska on which final certificates have issued to date, which carry an area of 5,446,848 acres, for which there has been paid $54,468.48. No coal claims have been patented. This explanation is made in view of the fact that in prior reports all proofs upon which payments were made were given as entries.

[2] Within the Ute Indian Reservation.

[3] Territory.

Land concessions by acts of Congress to States and corporations for railroad and military wagon-road purposes from the year 1850 to June 30, 1912.

STATE GRANTS.

	Acres.
Illinois:	
Illinois Central	2,595,133.00
Mississippi:	
Mobile & Ohio River	[1] 737,130.29
Vicksburg & Meridian	199,101.51
Gulf & Ship Island	139,113.22
	1,075,345.02
Alabama:	
Mobile & Ohio River	[1] 419,528.44
Alabama & Florida	399,022.84
Selma, Rome & Dalton	458,555.82
Coosa & Tennessee	67,784.96
Mobile & Girard	[2] 302,181.16
Alabama & Chattanooga	653,888.76
South & North Alabama	445,438.43
	2,746,400.41
Florida:	
Florida Central & Peninsular	730,353.55
Florida & Alabama	166,691.08
Pensacola & Georgia	1,279,236.70
Florida, Atlantic & Gulf Central	29,384.18
	2,205,665.51
Louisiana:	
Vicksburg, Shreveport & Pacific	467,654.02
New Orleans, Opelousas & Great Western	[3]

[1] In the adjustment of this grant the road was treated as an entirety and without reference to the State line; hence Alabama has had approved to her more and Mississippi less than they would appear to be entitled to in proportion to the length of the road in the respective States.

[2] This grant was adjusted Apr. 24, 1893, and 302,181.16 acres were allotted to the company. The balance of the previously certified lands were ordered restored to entry under the forfeiture act of Sept. 29, 1890.

[3] Certified lands, footing 719,189.79 acres, were reconveyed to the United States by the governor of Louisiana Feb. 24, 1888, the grant having been forfeited by the act of July 14, 1870 (16 Stat., 277).

	Acres.
Arkansas:	
St. Louis, Iron Mountain & Southern	1,325,355.46
Little Rock & Fort Smith	1,052,082.51
Memphis & Little Rock	184,657.33
	2,562,095.30
Missouri:	
Southwest branch of the Pacific road	1,161,284.51
Hannibal & St. Joseph	611,323.35
St. Louis, Iron Mountain & Southern	65,120.31
	1,837,728.17
Iowa:	
Burlington & Missouri River	389,990.11
Chicago, Rock Island & Pacific	[1] 483,214.36
Cedar Rapids & Missouri River	161,532.81 [1] 922,813.67 244,022.96
Dubuque & Sioux City	[1] 556,406.74
Iowa Falls & Sioux City	683,057.34
Des Moines Valley	840,091.36
Chicago, Milwaukee & St. Paul	326,216.10
McGregor & Missouri River Sioux City & St. Paul	322,412.81
	4,929,758.26
Michigan:	
Port Huron & Lake Michigan	37,467.44
Jackson, Lansing & Saginaw	743,787.58
Grand Rapids & Indiana	852,521.10
Flint & Pere Marquette	512,877.03
Marquette, Houghton & Ontonagon	[2] 305,929.59
Ontonagon & Brule River	34,227.08
Bay de Noquet & Marquette	128,301.05
Chicago & North Western	518,065.36
	3,133,176.23
Wisconsin:	
Chicago, St. Paul, Minneapolis & Omaha (formerly West Wisconsin)	813,706.71
Wisconsin Railroad Farm Mortgage Land Co.	163,159.65
Chicago, St. Paul, Minneapolis & Omaha (formerly St. Croix & Lake Superior)	816,487.76
Branch to Bayfield	471,721.14
Chicago & North Western	546,446.20
Wisconsin Central	838,227.69
	3,649,749.15
Minnesota:	
St. Paul, Minneapolis & Manitoba (formerly first division, St. Paul & Pacific) Western Railroad (succeeded by St. Paul & Northern Pacific Railroad Co.) St. Paul, Minneapolis & Manitoba (formerly St. Vincent extension of the St. Paul & Pacific)	[3] 3,256,477.73

[1] Includes 35,685.49 acres of the Chicago, Rock Island & Pacific R. R.; 109,756.85 acres of the Cedar Rapids & Missouri River R. R.; and 77,535.22 acres of the Dubuque & Sioux City R. R., situated in the old Des Moines River grant of Aug. 8, 1846, which should be deducted from the foregoing amount. (Wolcott *v.* Des Moines Co., 5 Wall., 631.)

[2] Excess of 131,481.71 acres originally certified under this grant reconveyed by State or entered under act Mar. 3, 1887, by Michigan Land & Iron Co. (Ltd.), grant having been forfeited in part by act Mar. 2, 1889 (25 Stat., 1008).

[3] Declared to be one grant. (See 32 L. D., 21.)

	Acres.
Minnesota—Continued.	
Minnesota Central	179,734.29
Winona & St. Peter	1,680,974.92
St. Paul & Sioux City	1,126,578.55
St. Paul & Duluth	860,973.62
Southern Minnesota, from a point on the Mississippi River to Houston	546,745.44
Southern Minnesota, extension (now Chicago, Milwaukee & St. Paul)	
Hastings & Dakota	377,776.15
	8,028,999.95
Minnesota, North Dakota, Montana, Washington:	
St. Paul, Minneapolis & Manitoba, now Great Northern (main and branch), a special act (Aug. 5, 1892, 27 Stat. L., 390) to provide for indemnity for lands relinquished by the company	[1]
Kansas:	
Leavenworth, Lawrence & Galveston	[2] 249,446.13
Missouri, Kansas & Texas	[3] 976,593.22
Atchison, Topeka & Santa Fe	2,944,788.14
St. Joseph & Denver City	462,933.24
	4,633,760.73
Grand total of State grants	37,864,726.48

CORPORATION GRANTS.

Union Pacific	11,930,685.95
Central Pacific	5,842,717.72
Central Pacific (successor by consolidation with Western Pacific)	458,147.97
Central Branch Union Pacific	223,080.50
Union Pacific (Kansas division)	6,175,660.63
Union Pacific (successor to Denver Pacific Ry. Co.)	807,564.76
Burlington & Missouri River in Nebraska	2,374,090.77
Sioux City & Pacific (now Missouri Valley Land Co.)	42,610.95
Northern Pacific	33,294,334.48
Oregon Branch of the Central Pacific (California & Oregon)	3,154,994.16
Oregon & California	2,765,677.10
Atlantic & Pacific (now Santa Fe Pacific)	4,280,502.45
Southern Pacific (main line)	3,677,509.83
Southern Pacific (branch line)	1,451,281.08
Oregon Central	128,618.13
New Orleans Pacific	1,001,783.27
Grand total to corporations	77,609,259.75

WAGON ROADS.

From Lake Erie to Connecticut Western Reserve	80,773.54
From Lake Michigan to Ohio River	170,580.24
From Fort Wilkins, Copper Harbor, Mich., to Green Bay, Wis.	302,930.96
From Fort Wilkins, Copper Harbor, to Wisconsin State line	221,013.35
Oregon Central Military Co. (now California & Oregon Land Co.)	673,156.07
Corvallis & Yaquina Bay	81,895.25
Willamette Valley and Cascade Mountain	861,511.86
Dalles Military Road	556,827.04
Coos Bay Military Road	105,240.11
Grand total	3,053,928.42

[1] See Minnesota for original grants.

[2] Includes 186,936.72 acres of the "Osage ceded reservation," which are to be deducted from the above amount under the decision of the Supreme Court in the case of the Leavenworth, Lawrence & Galveston Railroad *v.* The United States (92 U. S., 733).

[3] Includes 270,970.78 acres in the "Osage ceded reservation," which are to be deducted under the decision cited in note 3.

Withdrawals under the act of Mar. 15, 1910, from the passage of the act to June 30, 1912.

State.	Amount applied for.	Rejected or eliminated before withdrawal.	Withdrawn.	Restored.
	Acres.	*Acres.*	*Acres.*	*Acres.*
Colorado	911,190.96	46,648.49	311,475.90	232,399.13
Idaho	342,453.84	34,206.80	292,526.09	203,874.21
Montana	110,027.61	37,063.83	32,976.29	32,976.29
Nevada	1,021,205.78	304,854.52	271,149.84	270,987.74
New Mexico	383,951.62	56.36	10,000.00	10,000.00
Oregon	595,316.37	203,485.90	205,060.33	156,533.72
Utah	242,653.23	36.88	188,676.77	167,611.03
Wyoming	230,595.95	16,694.24	73,820.42	591.17
Total	3,837,395.36	643,047.02	1,385,685.64	1,092,973.29

State desert-land segregation under section 4 of the act of Aug. 18, 1894 (28 Stat., 372–422), and the acts amendatory thereof, commonly known as the Carey Act, with the action taken thereon from the passage of the act to June 30, 1912.

State.	Applied for.	Segregated.	Rejected or relinquished.	Patented.	Reconveyed.	Time to reclaim extended.
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Colorado	373,593.56	272,197.98	46,221.77			
Idaho	3,106,994.17	1,299,541.63	877,609.93	295,995.68		51,178.46
Montana	554,432.63	200,597.06	373,206.74	25,653.03	10,104.03	62,604.95
Nevada	163,789.05	36,808.59	47,229.35			
New Mexico	10,164.68	7,564.68	2,600.00			
Oregon	736,163.60	338,617.19	229,647.12	51,583.13	6,014.49	
Utah	435,170.02	136,820.63	267,980.83			
Washington	155,649.39		155,649.39			
Wyoming	1,765,079.48	999,083.61	300,400.66	100,767.67	3,977.23	17,397.53
Total	7,301,036.58	3,291,231.37	2,300,545.79	473,999.51	20,095.75	131,180.94

Public and Indian lands entered each year ended June 30, from 1906 to 1912, inclusive.

States or Territories.	1906	1907	1908	1909	1910	1911	1912
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
Alabama	102,621.51	92,530.30	81,228.56	50,930.86	47,353.42	49,518.88	90,615.04
Alaska	4,925.86	7,132.16	3,834.80	10,772.33	17,508.03	15,477.69	5,244.95
Arizona	107,054.87	86,121.64	198,509.64	468,160.64	541,793.23	486,066.86	669,292.97
Arkansas	441,530.07	496,015.40	333,676.41	171,316.50	137,637.76	201,006.00	247,318.58
California	809,811.28	579,294.93	766,932.98	1,290,579.46	1,214,348.36	1,064,644.89	872,301.68
Colorado	1,597,010.38	2,483,666.69	2,127,661.99	1,983,078.58	3,994,757.50	2,272,068.99	1,354,326.05
Florida	166,053.73	109,663.03	83,072.78	125,744.65	121,837.68	144,809.48	183,061.64
Idaho	734,763.70	1,162,745.25	1,087,402.94	1,383,443.88	1,768,010.34	1,191,012.91	860,840.25
Illinois	40.00	296.30	40.00				
Indiana		129.70	10.08	40.00			
Iowa	957.93	195.65	1,433.69	564.04	160.02		
Kansas	669,438.67	611,726.97	332,931.81	166,375.14	157,311.36	122,810.19	71,915.69
Louisiana	80,086.61	89,608.79	59,450.26	39,428.40	22,344.86	24,432.63	16,491.13
Michigan	38,669.10	42,828.40	46,147.59	33,813.58	19,612.94	17,189.17	17,222.57
Minnesota	397,567.07	324,418.22	429,351.12	385,816.56	295,177.03	239,830.59	397,158.46
Mississippi	75,856.78	55,645.26	35,545.37	35,908.88	29,339.15	34,440.75	27,708.14
Missouri	101,426.89	154,871.72	129,157.20	53,560.91	52,509.66	19,292.74	21,958.55
Montana	1,782,279.90	1,218,780.97	1,494,052.02	2,460,905.55	6,616,734.69	4,659,232.48	3,687,420.90
Nebraska	1,736,964.79	1,785,762.47	1,781,823.80	1,979,872.10	1,638,485.72	1,505,584.66	1,394,388.57
Nevada	278,904.38	47,254.63	60,131.50	78,190.07	261,125.24	312,510.88	261,188.07
New Jersey	90.03						
New Mexico	1,235,059.38	2,758,006.91	2,850,337.11	2,542,799.18	1,924,145.46	1,377,563.07	1,050,399.79
North Dakota	3,325,828.23	2,256,423.56	1,383,957.19	877,649.71	807,512.18	513,357.48	384,218.11
Oklahoma	1,426,306.46	2,007,753.84	514,159.58	297,572.30	193,692.95	146,600.50	97,563.31
Oregon	617,293.21	951,481.34	1,021,001.29	1,091,530.56	1,050,723.53	742,049.87	715,869.45
South Dakota	1,707,684.39	1,502,411.24	2,086,171.82	2,219,560.32	2,946,827.85	1,711,629.43	696,546.70
Utah	413,030.21	334,827.36	469,311.88	619,802.07	577,459.86	693,770.08	549,883.11
Washington	989,907.66	911,327.34	825,813.57	608,546.35	560,789.20	481,459.19	382,565.57
Wisconsin	55,592.44	28,066.92	57,595.61	19,061.18	17,007.33	17,970.36	16,099.44
Wyoming	534,431.94	897,679.59	829,614.19	897,479.96	1,377,063.74	1,167,042.50	503,090.10
Total	19,431,187.47	20,997,396.58	19,090,356.78	19,892,503.76	26,391,269.09	19,211,372.27	14,574,688.82

Unappropriated lands on June 30, 1912.

[A circular showing area unappropriated, by counties, is distributed on request.]

States or Territories.	Area unappropriated and unreserved.			States or Territories.	Area unappropriated and unreserved.		
	Surveyed.	Unsurveyed.	Total.		Surveyed.	Unsurveyed.	Total.
	Acres.	*Acres.*	*Acres.*		*Acres.*	*Acres.*	*Acres.*
Alabama	93,040	1,600	94,640	Montana	13,697,086	15,356,909	29,053,995
Alaska	.....	[1]368,010,643	368,010,643	Nebraska	832,750	.....	832,750
Arizona	12,003,186	28,592,537	40,595,723	Nevada	28,844,824	26,230,679	55,075,503
Arkansas	436,210	82,000	518,210	New Mexico	22,241,833	11,329,650	33,571,483
California	17,671,839	5,343,499	23,015,338	North Dakota	1,354,571	.....	1,354,571
Colorado	17,684,401	1,564,797	19,249,198	Oklahoma	39,525	.....	39,525
Florida	240,408	155,531	395,939	Oregon	13,141,921	3,746,148	16,888,069
Idaho	7,172,856	11,757,537	18,930,393	South Dakota	4,039,892	81,920	4,121,812
Kansas	91,328	.....	91,328	Utah	12,011,921	22,037,256	34,049,177
Louisiana	69,198	.....	69,198	Washington	1,106,783	761,306	1,868,089
Michigan	92,544	.....	92,544	Wisconsin	11,520	.....	11,520
Minnesota	1,525,775	.....	1,525,775	Wyoming	30,905,022	2,570,720	33,475,742
Mississippi	52,400	.....	52,400				
Missouri	1,197	.....	1,197	Grand total	185,362,030	497,622,732	682,984,762

[1] The unreserved lands in Alaska are mostly unsurveyed and unappropriated.

Public lands surveyed and remaining unsurveyed.

States or Territories.	Land area.	Surveyed during fiscal year ended June 30, 1912.	Surveyed to June 30, 1912.	Unsurveyed.
	Acres.	*Acres.*	*Acres.*	*Acres.*
Alabama	32,818,560	.....	32,818,560	.....
Alaska	378,165,760	23,004	[1] 39,717	378,126,043
Arizona	72,857,600	294,544	21,573,024	51,284,576
Arkansas	33,616,000	.....	33,616,000	.....
California	99,898,880	259,310	78,609,578	21,289,302
Colorado	66,341,120	55,872	63,233,329	3,107,791
Florida	35,111,040	.....	30,912,571	4,198,469
Illinois	35,841,280	.....	35,841,280	.....
Indiana	22,966,400	.....	22,966,400	.....
Iowa	35,575,040	.....	35,575,040	.....
Idaho	53,618,560	761,800	27,811,599	25,806,961
Kansas	52,335,360	.....	52,335,360	.....
Louisiana	29,061,760	3,904	27,181,384	1,880,376
Michigan	36,787,200	.....	36,787,200	.....
Minnesota	51,749,120	.....	49,822,176	1,926,944
Mississippi	29,671,680	.....	29,671,680	.....
Missouri	43,985,280	.....	43,985,280	.....
Montana	93,296,640	2,316,819	60,616,942	32,679,698
Nebraska	49,157,120	.....	49,157,120	.....
Nevada	70,285,440	140,334	39,845,604	30,439,836
New Mexico	78,401,920	263,657	54,031,490	24,370,430
North Dakota	44,917,120	191,998	42,769,192	2,147,928
Ohio	26,073,600	.....	26,073,600	.....
Oregon	61,188,480	331,419	49,681,569	11,506,911
Oklahoma	44,424,960	.....	44,424,960	.....
South Dakota	49,195,520	65,951	49,180,347	15,170
Utah	52,597,760	1,138,846	27,745,609	24,852,151
Wisconsin	35,363,840	.....	35,363,840	.....
Washington	42,775,040	809,349	33,183,824	9,591,216
Wyoming	62,460,160	1,118,289	58,466,339	3,993,821
Total	1,820,538,240	7,775,096	1,193,320,614	627,217,623

[1] Nearly 300,000 acres of Alaska surveys have been executed in the field, but returns are not completed.

REPORT OF THE COMMISSIONER OF PENSIONS.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., August 31, 1912.

SIR: I have the honor to submit the following report, showing the operations of the Bureau of Pensions for the fiscal year ended June 30, 1912.

GENERAL STATEMENT.

In Exhibit 1 will be found the gains and losses to the roll by classes and the amount disbursed to each class of pensioners during the year. The number of pensioners on the roll June 30, 1911, was 892,098, and the number June 30, 1912, was 860,294, a net loss of 31,804, as shown in the following table:

Gains and losses in pension roll during the fiscal year 1912.

Losses to the roll:		
By death	52,863	
By remarriage	799	
By minors attaining the age of 16 years	929	
By failure to claim pension for 3 years	295	
From all other causes	229	
Total		55,115
Gains to the roll:		
By original allowance	22,712	
By restoration and renewal allowances	599	
Total		23,311
Net loss to the roll		31,804

The number of survivors of the Civil War on the pension roll at the close of the fiscal year was 497,263, a net loss to the roll of 32,621. The number of survivors whose names were dropped from the roll during the year on account of death was 33,891. The number of new names added to the roll was 1,513.

The number of individuals in the military and naval service of the United States during the Civil War is estimated at 2,213,365. As the number of survivors on the pension roll is less than 500,000, it is evident that 75 per cent or more of those who rendered service in the Civil War are deceased. The annual death rate of the survivors is nearly 7 per cent, and the average age is approximately 71 years.

The following summary shows the number of pensioners on the roll at the close of the fiscal years 1912 and 1911, together with the net gain or loss in each class during the year.

Pensioners on the roll June 30, 1912, and June 30, 1911.

	1912	1911	Gain.	Loss.
War of 1812:				
Widows	238	279		41
Indian wars:				
Survivors	1,210	1,387		177
Widows	2,439	2,629		190
War with Mexico:				
Survivors	1,313	1,639		326
Widows	5,533	5,982		449
Civil War:				
Act of May 11, 1912—				
Survivors	13,246		13,246	
Act of Feb. 6, 1907—				
Survivors	333,579	356,830		23,251
General law—				
Invalids	103,237	113,063		9,826
Widows	64,135	67,509		3,374
Minor children	351	385		34
Mothers	1,413	1,877		464
Fathers	202	278		76
Brothers, sisters, sons, and daughters	331	353		22
Helpless children	515	508	7	
Act of June 27, 1890—				
Invalids	47,201	59,991		12,790
Minor children	4,063	3,983	80	
Helpless children	416	375	41	
Act of April 19, 1908—				
Widows	232,947	228,198	4,749	
Army nurses	362	406		44
War with Spain:				
Invalids	23,841	23,383	458	
Widows	1,238	1,217	21	
Minor children	304	326		22
Mothers	2,951	3,032		81
Fathers	508	522		14
Brothers, sisters, sons, and daughters	6	9		3
Helpless children	2	1	1	
Regular establishment:				
Invalids	14,373	13,757	616	
Widows	2,869	2,799	70	
Minor children	171	149	22	
Mothers	1,129	1,066	63	
Fathers	159	152	7	
Brothers, sisters, sons, and daughters	4	8		4
Helpless children	8	5	3	
Total	860,294	892,098	19,384	51,188
Net loss				31,804

The number of soldiers and sailors on the pension roll at the close of the year was 538,000, the number of dependents and widows was 321,932, and the number of Army nurses was 362.

In Exhibit 2 will be found the number and amount of first payments made under each class of new certificates issued during the year. The total amount of first payments made during the year was $4,096,502.81 on 78,781 new certificates. The number of certificates issued during the year remaining unpaid at the close of the year was 13,330, upon which there was due $514,631.36. The appropriation for the payment of pensions became exhausted before the close of the year and the payments due on these cases could not be made until the new appropriation for the fiscal year 1913 became available on July 1, 1912. The bill making appropriation for the payment of pensions for the fiscal year 1913 was amended in the Senate, after the act of May 11, 1912, became a law, providing that $500,000 of the appropriation should become immediately available. This provision was made in order that there would be sufficient funds to meet the increased payments due on the certificates issued under the act of May 11, 1912, before the close of the fiscal year. However, this bill failed to become

a law before the close of the fiscal year and the $500,000 which was to be provided therein did not become available and the amount due as first payments on a large number of certificates could not be paid until the enactment of the joint resolution of July 1, 1912, extending the appropriation of the previous year for the month of July.

The amount paid as attorneys' fees upon claims allowed by the bureau during the fiscal year 1912 was $138,837.72.

The following table shows the first payments made on new certificates each year during the last five years:

First payments made during the last five years.

Fiscal year.	Number.	Amount.	Average.
1912	78,781	$4,096,502	$52.00
1911	93,632	4,842,925	51.72
1910	91,448	4,858,504	52.13
1909	124,634	6,489,416	52.07
1908	316,500	13,394,633	42.32

Average first payments in each class.

Average value of first payments:	
In original cases	$89.64
In original regular establishment cases	120.19
In original act Feb. 6, 1907, cases	93.28
In original general law, Civil War cases	177.44
In original act June 27, 1890, cases	267.08
In original act Apr. 19, 1908, cases	53.15
In original War with Spain cases	332.66
In increase and reissue cases	34.40
In original War with Mexico cases	164.52
In original Indian war cases	285.59

In Exhibit 3 is shown the appropriations and disbursements for the fiscal year 1912 and the unexpended balances at the close of the year, a summary of which is as follows:

Appropriations and disbursements for fiscal year ended June 30, 1912.

Appropriation for pensions	$153,000,000.00
Repayments to the appropriation	4,727.89
Total amount available for pensions	153,004,727.89
Amount disbursed	152,986,433.72
Unexpended balance	18,294.17
Appropriation for medical examinations	200,000.00
Repayments to the appropriation	15.00
Total amount available	200,015.00
Amount expended and authorized	170,782.00
Unexpended balance	29,233.00
Appropriation for salaries and clerk hire, pension agencies	457,003.00
Amount disbursed	448,653.78
Unexpended balance	8,349.22

Appropriation for rent and contingent expenses of agencies	$29,501.39
Amount expended and outstanding obligations	27,250.00
Unexpended balance	2,251.39
Appropriation for salaries, Bureau of Pensions	1,483,620.00
Disbursed for salaries, Bureau of Pensions	1,461,913.42
Unexpended balance	21,706.58
Appropriation for salaries, per diem and expenses, special examiners	273,500.00
Amount expended	271,000.67
Unexpended balance	2,499.33

Summary of unexpended balances, exclusive of pensions, covered into the Treasury at the close of the fiscal year 1912.

Salaries in bureau	$21,706.58
Salaries, per diem, and expenses, special examiners	2,499.33
Fees, examining surgeons	29,233.00
Salaries and clerk hire, pension agencies	8,349.22
Contingent expenses of agencies	2,251.39
Total	64,039.52

In Exhibit 4 is shown the amount disbursed for pensions, salaries, clerk hire, and contingent expenses at each of the pension agencies. It also shows the amount disbursed by the pension agency in New York, N. Y., for rent, and that disbursed by the pension agency in Washington, D. C., for fees of examining surgeons. There are more than 4,000 examining surgeons, and all are paid through the agency in this city.

The amount disbursed for fees of examining surgeons for the fiscal year 1912 was $128,206.17. This does not include the amount required for fees during the last quarter of the fiscal year, as the accounts were not received by the bureau until after the close of the fiscal year. It is estimated that the cost of medical examinations during the fiscal year 1912, after all the accounts have been settled, will be $170,782.

The amount expended for Navy pensions was $5,319,822.08, a decrease of $72,663.23 as compared with the previous year.

The law provides that Navy pensions shall be paid from the income of the Navy-pension fund, so far as the same shall be sufficient for that purpose. The income from the Navy-pension fund covers but a small fraction of the amount required each year for the payment of Navy pensions, as is shown in the following statement for the last five years.

Interest on Navy-pension fund and the amount paid for Navy pensions each year for the past five years.

Fiscal year.	Interest.	Navy pensions.	Fiscal year.	Interest.	Navy pensions.
1912	$367,009	$5,319,822	1909	$371,345	$5,337,014
1911	378,159	5,392,485	1908	360,409	4,934,350
1910	362,299	5,335,457			

The amount disbursed for pensions from July 1, 1790, to June 30, 1865, was $96,445,444.23. The amounts disbursed each year since that date, the cost of administration, including the entire expenses of the bureau in the settlement of claims, the cost of the pension-agency service and fees, and expenses of examining surgeons, and the number of pensioners on the roll at the close of each fiscal year are shown in the following table:

Disbursements for pensions and maintenance of pension system, 1866 to 1912.

Fiscal year.	Paid as pensions.	Cost, maintenance, and expenses.	Total.	Number of pensioners.
1866	$15,450,549.88	$407,165.00	$15,857,714.88	126,722
1867	20,784,789.69	490,977.35	21,275,767.04	155,474
1868	23,101,509.36	553,020.34	23,654,529.70	169,643
1869	28,513,247.27	564,526.81	29,077,774.08	187,963
1870	29,351,488.78	600,997.86	29,952,486.64	198,686
1871	28,518,792.62	863,079.00	29,381,871.62	207,495
1872	29,752,746.81	951,253.00	30,703,999.81	232,229
1873	26,982,063.89	1,003,200.64	27,985,264.53	238,411
1874	30,206,778.99	966,794.13	31,173,573.12	236,241
1875	29,270,404.76	982,695.35	30,253,100.11	234,821
1876	27,936,209.53	1,015,078.81	28,951,288.34	232,137
1877	28,182,821.72	1,034,459.33	29,217,281.05	232,104
1878	26,786,009.44	1,032,500.09	27,818,509.53	223,998
1879	33,664,428.92	837,734.14	34,502,163.06	242,755
1880	56,689,229.08	935,027.28	57,624,256.36	250,802
1881	50,583,405.35	1,072,059.64	51,655,464.99	268,830
1882	54,313,172.05	1,466,236.01	55,779,408.06	285,697
1883	60,427,573.81	2,591,648.29	63,019,222.10	303,658
1884	57,912,387.47	2,835,181.00	60,747,568.47	322,756
1885	65,171,937.12	3,392,576.34	68,564,513.46	345,125
1886	64,091,142.90	3,245,016.61	67,336,159.51	365,783
1887	73,752,997.08	3,753,400.91	77,506,397.99	406,007
1888	78,950,501.67	3,515,057.27	82,465,558.94	2,557
1889	88,842,720.58	3,466,968.40	92,309,688.98	489,725
1890	106,093,850.39	3,526,382.13	109,620,232.52	537,944
1891	117,312,690.50	4,700,636.44	122,013,326.94	676,160
1892	139,394,147.11	4,898,665.80	144,292,812.91	876,068
1893	156,906,637.94	4,867,734.42	161,774,372.36	966,012
1894	139,986,726.17	3,963,976.31	143,950,702.48	969,544
1895	139,812,294.30	4,338,020.21	144,150,314.51	970,524
1896	138,220,704.46	3,991,375.61	142,212,080.07	970,678
1897	139,949,717.35	3,987,783.07	143,937,500.42	976,014
1898	144,651,879.80	4,114,091.46	148,765,971.26	993,714
1899	138,355,052.95	4,147,517.73	142,502,570.68	991,519
1900	138,462,130.65	3,841,706.74	142,303,887.39	993,529
1901	138,531,483.84	3,868,795.44	142,400,279.28	997,735
1902	137,504,267.99	3,831,378.96	141,335,646.95	999,446
1903	137,759,653.71	3,993,216.79	141,752,870.50	996,545
1904	141,093,571.49	3,849,366.25	144,942,937.74	994,762
1905	141,142,861.33	3,721,832.82	144,864,694.15	998,441
1906	139,000,288.25	3,523,269.51	142,523,557.76	985,971
1907	138,155,412.46	3,309,110.44	141,464,522.90	967,371
1908	153,093,086.27	2,800,963.36	155,894,049.63	951,687
1909	161,973,703.77	2,852,583.73	164,826,287.50	946,194
1910	159,974,056.08	2,657,673.86	162,631,729.94	921,083
1911	157,325,160.35	2,517,127.06	159,842,287.41	892,098
1912	152,986,433.72	2,448,857.31	155,435,291.03	860,294
Total	4,286,922,719.65	123,328,719.05	4,410,251,438.70	

The cost of maintenance on account of improved methods and more economical administration is being gradually reduced each year. The cost for the fiscal year 1912 was $403,726.42 less than for the fiscal year 1909.

In this connection attention is invited especially to the two provisions contained in the act approved August 17, 1912, making appropriations for the payment of pensions for the present fiscal year. This

act provides for the abolishment of the pension agencies from and after the 31st day of January, 1913, and for the payment of pensions after that date by a disbursing clerk in the Bureau of Pensions. It also provides that not later than January 1, 1913, pensions shall be paid by checks drawn, under the direction of the Secretary of the Interior, in such form as to protect the United States against loss, without separate vouchers or receipts, except in certain cases. Pensions to inmates of the various branches of the National Home for Disabled Volunteer Soldiers will be paid to the treasurers of the different branches of the home as heretofore. There will be no change in the method of payment in such cases, nor will there be any change in the method of paying pensions in the cases of inmates of the Government Hospital for the Insane and the United States Soldiers' Home, Washington, D. C., nor in the cases in which pensions are paid through guardians. Vouchers in all such cases will be required as heretofore. It is also believed it will be necessary to require vouchers in the cases of all pensioners residing in foreign countries, and also in the case of widows who receive increase of pension on account of minor or helpless children. The payment of pensions without vouchers, as provided for in this act, is in accordance with the recommendations contained in my annual report for the fiscal year 1911.

This change in the method of paying pensions will save the expense of printing and distributing some 4,000,000 vouchers each year and the cost of furnishing nearly 4,000,000 penalty envelopes annually to pensioners in which to return vouchers for payment. It will also save the cost of transportation in carrying 4,000,000 pieces of mail each year which are now carried through the mails, free of postage, in the return penalty envelopes furnished to pensioners without charge. The greatest saving, however, will be in behalf of the pensioners themselves. Each pensioner is required to execute a voucher for each quarterly payment, or four vouchers per year. While many vouchers are executed free of expense by those authorized to administer oaths, it is estimated that the average cost per voucher is at least 25 cents, or $1 per pensioner each year. There are some 4,000,000 vouchers executed each year, and a saving to pensioners will, therefore, be nearly $1,000,000 per annum. The pensioners will also be enabled to receive their pension checks much more promptly than ever before. It is expected that the first payment, without vouchers, will be commenced on December 4, 1912. All checks will be prepared in advance and ready for mailing on the morning of the fourth day of the payment month. Checks for pensions due on December 4 will be mailed on that date.

The abolishment of the pension agencies and the payment of pensions by a disbursing clerk in this bureau will result in a much more efficient and economical administration than has ever been possible under the pension-agency system. Under the new system all duplication of records will be avoided. At the present time an order to inscribe is issued with each new certificate and becomes a part of the files of the pension agencies. These orders have been retained in each agency since the commencement of the pension system, and several millions of such orders will become useless upon the abolishment of the agencies and be disposed of as waste paper as soon as proper authority can be obtained from Congress. It is the practice in many of the agencies to have those orders bound in book form

for ready reference, which has been of great expense. These orders to inscribe will no longer be necessary upon the abolishment of the pension agencies, as all of the original records of the bureau will become readily accessible for reference when required in connection with the payment of pensions.

Many pensioners are constantly changing their residences, and when they move into a different pension-agency district they usually desire to have their name transferred to another agency. Pensioners are constantly going from one National Soldiers' Home to another, and each time it is necessary to transfer their names from one pension agency roll to another agency. All this will be avoided upon the abolishment of the pension agencies. The large correspondence heretofore necessary between the bureau and the pension agencies will be discontinued. The bureau will be enabled to supply any information desired in regard to the post-office address of any pensioner, or the date to which payment was last made, immediately upon request. All such data will become a part of the bureau records here in Washington. Heretofore such information could only be obtained by drawing from the files the papers in each pension case to ascertain upon which agency the pensioner's name is inscribed in order to obtain from the pension agency the present post-office address of the pensioner, or the date to which payment was last made, or such information as might be desired before replying to request for information from correspondents.

It has been the practice to make a separate record in the bureau of every certificate issued, showing the number, date of issue, name of beneficiary, date of commencement, rate, etc. Upon receipt by the pension agencies of the certificate these data are also made a matter of record in the agencies. The record thus made in the agency is a duplication of the record kept in the bureau. This has been necessary on account of the agencies being located in different cities where access to the records of the bureau could not be had. Upon the abolishment of the agencies and the transfer of all records to this bureau it will be necessary to keep one record only of the certificates issued, thus avoiding all duplication and relieving many clerks engaged in that class of work for assignment to other duties in connection with the adjudication of pension claims.

Upon the issuance of a pension certificate it is forwarded to the proper pension agency in whose district the beneficiary lives. There it is recorded and transmitted to the pensioner. It has been necessary heretofore, during the quarterly payments, to hold these certificates in the agency until the quarterly payment has been completed. They are then entered upon the roll, vouchers prepared, and forwarded to the address of the pensioner. Under the new system, certificates will be forwarded to the address of the pensioner by the bureau immediately upon being issued, together with a check for the amount due on such certificate from the date of commencement thereof. This will enable those receiving new certificates to receive their checks at a much earlier date than has been possible heretofore. After the pension agencies have been abolished and the payment without vouchers fully established, it is believed that the reduction in the cost of administration will amount to about $250,000 per annum. Plans are being perfected as rapidly as possible to carry this legislation into effect at the earliest practicable date. The first payment,

after the abolishment of the agencies, will be February 4, 1913, and it is confidently believed that all checks in payment of pensions falling due on that date will be ready for mailing on the morning of February 4, 1913.

PENSIONS OF THE SEVERAL WARS AND OF THE PEACE ESTABLISHMENT.

The amounts that have been paid for pensions to soldiers, sailors, and marines, their widows, minor children, and dependent relatives, on account of military and naval service in the several wars and in the regular service since the foundation of the Government to June 30, 1912, are as follows:

War of the Revolution (estimate)	$70,000,000.00
War of 1812 (service pension)	45,890,843.39
Indian wars (service pension)	11,713,609.51
War with Mexico (service pension)	46,447,872.44
Civil War	4,129,699,071.99
War with Spain and insurrection in Philippine Islands	38,114,062.42
Regular establishment	25,014,227.67
Unclassified	16,488,476.49
Total disbursements for pensions	4,383,368,163.88

In Exhibit 5 is shown the number of pensioners by classes on the rolls of each of the agencies June 30, 1912, and the total number of pensioners on the rolls of each agency June 30, 1912, and June 30, 1911. There was a decrease in the number of pensioners at each of the agencies, the total decrease being 31,804, as has been shown elsewhere.

In Exhibit 6 is shown the number of pensioners in each State and Territory of the United States, in each insular possession, and in each foreign country at the close of the fiscal year, and the amounts paid to pensioners during the year in each of the localities mentioned. There are 854,622 pensioners residing in the different States and Territories, 207 residing in insular possessions, and 5,465 in foreign countries. Many of the pensioners whose checks are sent to them in foreign countries are residents of the United States but temporarily out of the country, either on business or pleasure. It is impossible to determine with any degree of accuracy the number of pensioners residing in foreign countries who are not citizens of the United States.

In Exhibit 7 is shown the number of pensioners of the various classes at each rate on the roll at the close of the year, except those pensioned by special acts of Congress, which is shown in Exhibit 8. Those pensioners on the roll at a less rate than $6 per month are beneficiaries on account of service in the United States Navy, under allowances granted by the Secretary of the Navy, as provided in section 4757, United States Revised Statutes. There are no pensioners under the general pension laws at a rate less than $6 per month.

In Exhibit 9 is shown the total number of pensioners on the roll by classes under the provisions of the general pension laws and the number, by classes, of those pensioned by special acts of Congress. The total annual value of each class at the close of the fiscal year is also shown in this exhibit. The total number of pensioners at the close of the year under the general pension laws was 838,210, and

the annual value thereof was $144,973,569.40. The number of pensioners on the roll, under special acts of Congress at the close of the year, was 22,084, and the annual value thereof was $6,584,572. The annual value of the pension roll is the amount which would be required to pay all the pensioners on the roll at the close of the year for one entire year at the rates then existing should no new names be added to the roll and none be dropped therefrom. The annual value of the pension roll at the close of the year was $151,558,141.40, a decrease as compared with the previous year of $3,276,096.40.

Exhibit 10 is a statement of pension certificates issued during the year. The following summary shows the number by classes:

Pension certificates issued during the fiscal year.

Originals	22,777	Renewals	1,219
Increases	38,817	Supplementals	155
Additionals	9		
Reissues	27,827	Total	90,922
Restorations	118		

The classes may be defined as follows:

Originals.—Cases in which no pension has before been granted.

Increases.—Cases in which increased rates are granted.

Additionals.—Issues under act of June 27, 1890, in lieu of pension under the general law.

Reissues.—Issues to allow for additional disabilities under the general law, to correct errors in former issues, and to allow pension under the general law, and under the acts of February 6, 1907, and May 11, 1912, in lieu of pension under other laws.

Restorations.—Issues to restore to the roll from date of last payment.

Renewals.—Issues to renew pension from a date new title is shown.

Supplementals.—Cases in which title exists under different laws and issue is made under one law for a period not covered by the other issue.

The number of pension certificates issued in the last 10 years is as follows:

Pension certificates issued during the last 10 years.

1903	132,821	1909	123,742
1904	153,938	1910	97,242
1905	185,242	1911	92,336
1906	136,905	1912	90,922
1907	236,516		
1908	328,676	Total	1,578,340

The number of certificates issued last year was the least issued in any year of the ten. The largest number was issued in 1908, the year most of the claims filed under the act of February 6, 1907, immediately after its passage, were adjudicated.

In addition to pension certificates, as above stated, there were also made during the year 2,835 reissues in lieu of certificates lost or destroyed, and allowances of accrued pension made in 19,493 cases, being issues for payment, in cases of deceased pensioners, from date of last payment to date of death.

Exhibit 11 is a summary of the pending files of the bureau at the close of the year, showing the number of claims of each class on file, as well as the number of each class based upon disabilities incurred or service rendered, in each of the wars and in the regular establishment.

The number of applications for pension pending at the close of the year was 422,464. The number pending at the beginning of the year was 36,793.

The increase is due to the large number of claims filed under the act of Congress approved May 11, 1912, more than 406,000 applications having been filed under that act between the date of its approval and the close of the fiscal year.

The following is a recapitulation of the pending files:

Claims pending at close of fiscal year, June 30, 1912.

Civil War	412,388	Old wars	8
War with Spain	6,762	Regular establishment	2,420
Mexican War	773		
Indian wars	109	Total	422,464
War of 1812	4		

In addition to the above there are many claims in the abandoned files of the bureau. If the prosecution of any of these claims is resumed and material evidence filed therein they will be restored to the pending files for adjudication.

There were also pending at the close of the year 28 claims for military bounty land warrants.

ACT OF FEBRUARY 6, 1907.

From the date of its approval to June 30, 1912, there were 680,146 applications filed under the act of February 6, 1907. During the last year 45,583 certificates were issued thereunder.

The following statement shows the number of certificates issued under this law each year:

Certificates issued under the act of February 6, 1907.

1907	119,337	1911	55,167
1908	257,855	1912	45,583
1909	67,219		
1910	57,634	Total	602,795

Of the above only 23,097 were original allowances or pensions granted to persons never before on the roll.

This act has now been superseded by the act of May 11, 1912, as all survivors of the Mexican War are granted $30 per month by the last-named act, and the rates provided by it for survivors of the Civil War are in excess of the rates provided by the former act.

There will be very few allowances hereafter under the act of 1907. No application executed and filed on or after May 11, 1912, will be adjudicated under that law.

ACT OF APRIL 19, 1908.

The second section of the act of April 19, 1908, grants pension at the rate of $12 per month to widows of persons who served 90 days or more in the Army or Navy of the United States during the Civil War, and who were honorably discharged, without regard to their pecuniary condition, if they were married prior to June 27, 1890.

The records show that prior to the close of the last fiscal year 84,906 certificates had been issued under this law.

While this is the number of certificates that have been issued under this act since its passage the number of widow pensioners now borne on the roll thereunder is very much larger. As the first section of this act increased from $8 to $12 per month the pensions of all widows on the roll under the act of June 27, 1890, the names of all widows on the roll under that law were transferred to the roll under the act of April 19, 1908, immediately after its enactment.

Since 1908 no widow pensioners have been borne on the roll under the act of June 27, 1890.

ACT OF MAY 11, 1912.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person who served ninety days or more in the military or naval service of the United States during the late Civil War, who has been honorably discharged therefrom, and who has reached the age of sixty-two years or over, shall, upon making proof of such facts, according to such rules and regulations as the Secretary of the Interior may provide, be placed upon the pension roll and be entitled to receive a pension as follows: In case such person has reached the age of sixty-two years and served ninety days, thirteen dollars per month; six months, thirteen dollars and fifty cents per month; one year, fourteen dollars per month; one and a half years, fourteen dollars and fifty cents per month; two years, fifteen dollars per month; two and a half years, fifteen dollars and fifty cents per month; three years or over, sixteen dollars per month. In case such person has reached the age of sixty-six years and served ninety days, fifteen dollars per month; six months, fifteen dollars and fifty cents per month; one year, sixteen dollars per month; one and a half years, sixteen dollars and fifty cents per month; two years, seventeen dollars per month; two and a half years, eighteen dollars per month; three years or over, nineteen dollars per month. In case such person has reached the age of seventy years and served ninety days, eighteen dollars per month; six months, nineteen dollars per month; one year, twenty dollars per month; one and a half years, twenty-one dollars and fifty cents per month; two years, twenty-three dollars per month; two and a half years, twenty-four dollars per month; three years or over, twenty-five dollars per month. In case such person has reached the age of seventy-five years and served ninety days, twenty-one dollars per month; six months, twenty-two dollars and fifty cents per month; one year, twenty-four dollars per month; one and a half years, twenty-seven dollars per month; two years or over, thirty dollars per month. That any person who served in the military or naval service of the United States during the Civil War and received an honorable discharge, and who was wounded in battle or in line of duty and is now unfit for manual labor by reason thereof, or who from disease or other causes incurred in line of duty resulting in his disability is now unable to perform manual labor, shall be paid the maximum pension under this Act, to wit, thirty dollars per month, without regard to length of service or age.

That any person who has served sixty days or more in the military or naval service of the United States in the War with Mexico and has been honorably discharged therefrom, shall, upon making like proof of such service, be entitled to receive a pension of thirty dollars per month.

All of the aforesaid pensions shall commence from the date of filing of the applications in the Bureau of Pensions after the passage and approval of this Act: *Provided*, That pensioners who are sixty-two years of age or over, and who are now receiving pensions under existing laws, or whose claims are pending in the Bureau of Pensions, may, by application to the Commissioner of Pensions, in such form as he may prescribe, receive the benefits of this act; and nothing herein contained shall prevent any pensioner or person entitled to a pension from prosecuting his claim and receiving a pension under any other general or special act: *Provided*, That no person shall receive a pension under any other law at the same time or for the same period that he is receiving a pension under the provisions of this act: *Provided further*, That no person who is now receiving or shall hereafter receive a greater pension, under any other general or special law, than he would be entitled to receive under the provisions herein shall be pensionable under this act.

SEC. 2. That rank in the service shall not be considered in applications filed hereunder.

SEC. 3. That no pension attorney, claim agent, or other person shall be entitled to receive any compensation for services rendered in presenting any claim to the Bureau of Pensions, or securing any pension, under this act, except in applications for original pension by persons who have not heretofore received a pension.

SEC. 4. That the benefits of this act shall include any person who served during the late Civil War, or in the War with Mexico, and who is now or may hereafter become entitled to pension under the acts of June twenty-seventh, eighteen hundred and ninety, February fifteenth, eighteen hundred and ninety-five, and the joint resolutions of July first, nineteen hundred and two, and June twenty-eighth, nineteen hundred and six, or the Acts of January twenty-ninth, eighteen hundred and eighty-seven, March third, eighteen hundred and ninety-one, and February seventeenth, eighteen hundred and ninety-seven.

SEC. 5. That it shall be the duty of the Commissioner of Pensions, as each application for pension under this act is adjudicated, to cause to be kept a record showing the name and length of service of each claimant, the monthly rate of payment granted to or received by him, and the county and State of his residence; and shall at the end of the fiscal year nineteen hundred and fourteen tabulate the record so obtained by States and counties, and shall furnish certified copies thereof upon demand and the payment of such fee therefor as is provided by law for certified copies of records in the executive departments.

This act grants pensions according to the length of service to persons who served 90 days or more in the military or naval service of the United States during the Civil War and were honorably discharged, who have reached certain ages, at rates as indicated in the following table:

Length of service.

Age.	90 days.	6 months.	1 year.	1½ years.	2 years.	2½ years.	3 years.
62	$13.00	$13.50	$14.00	$14.50	$15.00	$15.50	$16.00
66	15.00	15.50	16.00	16.50	17.00	18.00	19.00
70	18.00	19.00	20.00	21.50	23.00	24.00	25.00
75	21.00	22.50	24.00	27.00	30.00	30.00	30.00

It also grants pensions at the maximum rate, $30 per month, without regard to age or length of service, to persons who served in the military or naval service during the Civil War and received honorable discharges, and who were wounded in battle or in line of duty and are now unfit for manual labor by reason thereof, or who from disease or other causes incurred in line of duty resulting in their disabilities are now unable to perform manual labor.

It also provides a rate of $30 per month for surviving soldiers and sailors of the Mexican war who served 60 days or more and were honorably discharged.

Immediately after the approval of the act the bureau had a large number of blank forms of declarations printed for the use of beneficiaries under the law, and over 600,000 such blanks were furnished to Members of Congress, Grand Army posts, and soldiers' homes, and to many individual soldiers and sailors who made requests for them.

From the date of approval of the act to the close of the fiscal year, June 30, 1912, the bureau received 406,048 applications for pensions thereunder.

The following statement shows the number received each day during that time:

May 11	1	May 24	25,055	June 7	5,261	June 20	1,994
May 13	325	May 25	22,529	June 8	5,060	June 21	1,723
May 14	951	May 27	30,376	June 10	7,340	June 22	1,533
May 15	5,828	May 28	17,380	June 11	2,740	June 24	2,042
May 16	7,392	May 29	20,034	June 12	3,706	June 25	1,231
May 17	10,728	May 31	23,630	June 13	3,246	June 26	1,469
May 18	14,846	June 1	13,111	June 14	2,699	June 27	1,301
May 20	37,943	June 3	15,110	June 15	2,349	June 28	1,015
May 21	21,404	June 4	5,623	June 17	3,595	June 29	1,156
May 22	36,362	June 5	7,530	June 18	1,637		
May 23	29,328	June 6	7,445	June 19	2,080	Total	406,048

Receipts for these claims were sent to all applicants as soon as it was possible to do so, and the declarations were then examined to see whether or not they had been properly signed and sworn to in order that there might be no delay in calling for new ones in cases in which the execution was invalid.

The clerical force of the bureau was at once rearranged and adjusted to meet the conditions imposed upon it by the receipt of so many new applications, and within a very short time after the passage of the act the work of adjudicating the claims was commenced.

Before the close of the fiscal year, or within a little over a month and a half after the act was approved, 13,404 certificates had been issued thereunder.

TEN YEARS' SUMMARY.

The following table shows the operations of the bureau in the adjudication of pension claims each year for the past 10 years. "No benefit cases" are allowances under one law when the claimants are already in receipt of pension at an equal or higher rate under another law. As two pensions under different laws can not be paid to the same person covering the same period, the applicant in a case of this kind is permitted to elect which pension he will receive.

Summary of work for 10 years ending June 30, 1912.

Year.	Cases on hand.	Office force.	Applications filed.	Admissions.	Rejections.	No benefit cases.	Total number of cases adjudicated.
1903	304,809	1,736	225,871	130,109	113,794	8,203	252,106
1904	285,523	1,734	254,333	151,211	108,114	8,725	268,050
1905	220,822	1,709	217,435	182,207	81,853	4,915	268,975
1906	182,453	1,684	201,322	138,809	82,938	4,943	226,690
1907	356,181	1,534	440,517	238,249	60,573	3,892	302,715
1908	123,483	1,464	185,622	325,140	59,449	3,403	387,992
1909	66,226	1,385	152,009	123,610	52,199	1,772	177,581
1910	47,295	1,317	132,012	97,207	38,032	1,198	136,437
1911	36,793	1,222	120,814	92,274	30,930	1,065	124,319
1912	422,464	1,172	508,812	91,120	24,925	623	116,668

SPECIAL ACTS.

Since 1861 there have been granted by special acts of Congress 39,472 pensions and increases of pensions, of which 22,084 are now on the roll, with an annual face value of $6,584,572. Only a part of this is properly chargeable to special acts, as most of the beneficiaries had been previously pensioned under the general laws at lower rates.

Up to and including June 30, 1912, during the second session of the Sixty-second Congress 3,485 persons were included in the special acts passed at the rates specified in the summary following:

Pensions granted by special act during the second session of the Sixty-second Congress to and including June 30, 1912.

Rates specified.	Number granted.	Rates specified.	Number granted.
$100	1	$24	773
$72	1	$20	254
$65	1	$17	2
$60	1	$16	22
$50	75	$15	5
$46	1	$12	205
$40	134	$10	1
$36	286	$8	2
$35	1		
$30	1,706	Total	3,485
$25	14		

Of the above, 215 were granted to persons not in receipt of pensions, and 3,270 to persons then receiving smaller pensions.

The annual value of said special-act pensions is $1,174,716, and the annual increase due to the same is $579,168.

The following statement shows the number of pensions and increases of pensions granted by special acts during each Congress since March 4, 1861:

Number of pensions granted by special acts each Congress since Mar. 4, 1861.

Congress.	Number.	Congress.	Number.
Thirty-seventh (1861–1863)	12	Fifty-first (1889–1891)	1,388
Thirty-eighth (1863–1865)	27	Fifty-second (1891–1893)	217
Thirty-ninth (1865–1867)	138	Fifty-third (1893–1895)	119
Fortieth (1867–1869)	275	Fifty-fourth (1895–1897)	378
Forty-first (1869–1871)	85	Fifty-fifth (1897–1899)	694
Forty-second (1871–1873)	167	Fifty-sixth (1899–1901)	1,391
Forty-third (1873–1875)	182	Fifty-seventh (1901–1903)	2,171
Forty-fourth (1875–1877)	98	Fifty-eighth (1903–1905)	3,355
Forty-fifth (1877–1879)	230	Fifty-ninth (1905–1907)	6,030
Forty-sixth (1879–1881)	96	Sixtieth (1907–1909)	6,600
Forty-seventh (1881–1883)	216	Sixty-first (1909–1911)	9,649
Forty-eighth (1883–1885)	598	Sixty-second (1911 to June 30, 1912)	3,485
Forty-ninth (1885–1887)	856		
Fiftieth (1887–1889)	1,015	Total	39,472

CRIMINAL AND CIVIL SUITS.

There were 77 new cases presented by the bureau to the Department of Justice for prosecution on account of offenses against the pension laws, and indictments were found in 40 cases.

There were 35 cases brought to trial during the year, in 34 of which convictions were secured. Only two of these cases were against persons known to have rendered military or naval service. At the close of the year there were 116 cases pending in the hands of United States attorneys.

One civil suit was instituted and one was dismissed. There were four suits pending in the courts at the close of the year.

The sum of $3,448.04 was recovered through refundments.

BOUNTY-LAND WARRANTS.

During the year five original bounty-land warrants were issued, three for 160 acres each and two for 120 each, aggregating 720 acres.

A duplicate warrant was also issued in lieu of one for 160 acres that had been lost. Service to give title to bounty land must have been for at least 14 days, or in a battle, prior to March 3, 1855, and if in the Regular Army or Navy must have been in some war.

The following statement shows the total number of bounty-land warrants of all classes issued by the bureau (including partial estimate of those issued for service in the Revolutionary War) and the number of acres granted to June 30, 1912:

Bounty-land warrants issued to June 30, 1912.

	Number.	Acres.
War of the Revolution	16,663	2,666,080
War of 1812, acts prior to 1850	29,471	4,891,520
Act of 1847, Mexican War	88,274	13,213,640
Act of 1850, War of 1812, Mexican and Indian wars	189,146	13,168,560
Act of 1852, War of 1812, Mexican and Indian wars	11,992	694,400
Act of 1855, War of 1812, Mexican and Indian wars	263,144	34,158,070
Total	598,690	68,792,270

This bureau has no record of the warrants issued directly from the General Land Office under special acts of Congress or of those issued on account of the Virginia military land grants satisfied by the United States after the cession of the Northwestern Territory, and they are not included in the above table.

APPEALS.

To carry into effect the instructions of the Assistant Secretary of the Interior contained in the revised rules of practice in pension and bounty land appeals, dated August 15, 1911, I established September 1, 1911, a board composed of both legal and medical examiners of ability and experience, which has been designated as the Board of Reconsideration. All appeals as soon as they are filed in the bureau are forwarded to said board. The cases are then drawn from the files and all the evidence carefully reconsidered by the members of the board to determine whether or not the action of the bureau was correct and should be adhered to. In about 15 per cent of the cases in which appeals were filed since September 1, 1911, the bureau on the recommendation of said board receded from its action and the claims were reopened for further consideration and readjudication. In the other 85 per cent of the cases the action was adhered to and the appeals forwarded to the department for its action.

Aside from appeals in claims filed by deserted wives for division of pension and appeals relating to fees, there were 935 decisions rendered by the department prior to the close of the fiscal year on appeals taken on or after September 1, 1911. In 882 of these cases the action of the bureau was affirmed, and in 53 cases its action was reversed. There were, however, a number of these cases in which the action of the department was not in its true sense a reversal of the bureau. There were 13 cases in which the appeals were forwarded to the department with a statement that the bureau was willing to recede from its action in part, and the department in each of said cases concurred in the action recommended, yet noted the action as a reversal. There were also 2 cases wherein the bureau receded from its action which by some inadvertence were forwarded to the department and formal action was taken reversing the bureau. Eliminating these 15 cases from the calculation, the percentage of cases in which the action of the bureau was reversed was only a little over 4 per cent of those decided.

The percentage of reversals in cases decided during the entire year—that is, from June 30, 1911, to June 30, 1912—was slightly in excess of this.

LENGTH OF CIVIL WAR SERVICE.

The estimates made upon the various bills introduced into Congress based upon length of service have been severely criticized on the ground that such estimates gave the average length of service as far in excess of the actual service rendered during the Civil War.

The statistics relative to the length of service of the Civil War survivors were based on claims settled by the bureau soon after the passage of the act of June 27, 1890. Statistical cards were then made out in the cases of 475,237 survivors of the Civil War showing the date of enlistment and the date of discharge in each case. It was found upon compiling the data thus obtained that 71 per cent of the cases handled showed a service of one year and more during the Civil War.

The act of May 11, 1912, contains a provision requiring a record to be kept showing the name and length of service of each claimant and the monthly rate of payment granted to or received by him and the county and State of his residence. The number of cases in which such record has been kept to June 30, 1912, is 13,266.

The length of service shown in these cases is as follows:

Length of service.	Percentage.	Number.
Ninety days and less than six months	0.067	884
Six months and less than one year	.123	1,639
One year and less than one and one-half years	.105	1,395
One and one-half years and less than two years	.097	1,287
Two years and less than two and one-half years	.068	903
Two and one-half years and less than three years	.192	2,546
Three years and over	.348	4,612
Total		13,266

It will be seen that the number of survivors in the cases adjudicated under the act of May 11, 1912, up to June 30, 1912, who served one year or more is 81 per cent.

During the month of July 16,106 claims were adjudicated under the act of May 11, 1912, and of this number 12,428, or 77 per cent, served one year or more.

It will be seen, therefore, that the average length of service used by this bureau in all of the estimates submitted was too low rather than too high. This was due to the fact that when the statistical cards were collected under the act of June 27, 1890, many of the claimants who had rendered two or more services alleged but one of them.

Under the practice during the first few years after the passage of the act of June 27, 1890, claimants were not required to state whether any service was rendered other than the one alleged. This practice was subsequently changed and claimants required to allege all the various services rendered. It has been found, however, since the passage of the act of May 11, 1912, that quite a number of claimants under this act rendered other service than that heretofore alleged.

HISTORICAL.

There are now no pensioners on account of the Revolutionary War on the roll. The last widow pensioner of that war was Esther S. Damon, of Plymouth Union, Vt., who died November 11, 1906, aged 92 years. The last survivor of the Revolution was Daniel F.

Bakeman, who died at Freedom, Cattaraugus County, N. Y., April 5, 1869, aged 109 years 6 months and 8 days.

The last surviving pensioned soldier of the War of 1812 was Hiram Cronk, of Ava, N. Y., who died May 13, 1905, aged 105 years and 16 days. The names of 238 widows of the War of 1812 remained on the pension roll June 30, 1912.

MISCELLANEOUS.

There were 1,427 claims for reimbursement for expenses of the last sickness and burial of deceased pensioners pending at the beginning of the year; 7,605 such claims were received during the year, and 133 which had been disallowed were reopened, making a total of 9,165. Of these, 6,005 were allowed, 1,126 disallowed, and 814 abandoned, leaving 1,220 pending at the close of the year.

The mail received during the year numbered 1,486,577 pieces, and the outgoing mail aggregated 1,201,923 pieces, making a total of 2,688,500 handled, an average of nearly 8,700 daily.

During the year 116,668 pension claims were adjudicated, of which 91,120 were admitted, 24,925 rejected, and 623 approved in which no certificates were issued because they would not have benefited the applicants. There were also 28 claims for military bounty-land warrants adjudicated, of which 7 were allowed and 21 rejected.

Since the passage of the act of March 3, 1899, providing for the division of pension of resident pensioners of the United States who desert their wives and children or who are inmates of national or State soldiers' and sailors' homes, 14,021 claims have been filed thereunder, 7,675 of which have been allowed and 6,182 rejected, leaving 164 pending.

During the year the names of 130 pensioners were dropped from the roll for various causes after due legal notice had been given. The pensions of 29 persons were reduced, and reissues were made in 64 cases to recover erroneous payments.

Most of the surgeons appointed to examine applicants for pension are organized into boards of three members each; but it is sometimes necessary to have single surgeons or specialists make examinations of claimants who can not go before a board or who require the attention of a specialist. On June 30, 1912, there were 4,601 examining surgeons, and during the year 21,670 examinations were made, at an expense of $170,782.

During the year 508,812 applications for pension or increase of pension were received in the bureau. There were also received 5,927 applications for accrued pension due at death of pensioners, 7,605 applications for reimbursement for the expenses of the last sickness and burial of deceased pensioners, 521 applications for division of pension, and 31 applications for military bounty-land warrants.

There were 2,926 cases for special examination on hand July 1, 1911, and 5,517 were referred during the year for such examination, making a total of 8,443. Of these, 5,649 were disposed of, leaving 2,794 on hand June 30, 1912.

The average number of special examiners in the field during the year was 124.

Very respectfully,

J. L. DAVENPORT,
Commissioner of Pensions.

The SECRETARY OF THE INTERIOR.

* * * * * * *

EXHIBIT 6.—*Number of pensioners in each State and Territory, each insular possession, and each foreign country on the rolls June 30, 1912, and the amounts paid therein during the fiscal year 1912.*

State or Territory.	Number.	Amount.
Alabama	3,585	$608,703.59
Alaska	74	13,310.53
Arizona	852	117,785.71
Arkansas	10,438	1,715,960.27
California	29,670	5,194,775.76
Colorado	8,772	1,574,102.51
Connecticut	10,673	1,827,668.46
Delaware	2,497	441,179.99
District of Columbia	8,046	1,435,994.98
Florida	5,121	894,152.21
Georgia	3,259	527,263.24
Idaho	2,375	447,103.30
Illinois	59,353	10,559,758.30
Indiana	52,413	10,015,321.80
Iowa	30,205	5,463,051.05
Kansas	33,241	5,938,099.23
Kentucky	22,777	4,022,588.45
Louisiana	6,191	973,892.01
Maine	15,142	2,804,068.03
Maryland	11,735	2,081,560.11
Massachusetts	36,121	6,094,662.53
Michigan	36,226	6,580,667.90
Minnesota	13,349	2,325,040.81
Mississippi	4,403	727,552.02
Missouri	42,786	7,645,626.01
Montana	2,460	411,694.72
Nebraska	14,090	2,524,192.44
Nevada	405	65,003.28
New Hampshire	6,820	1,282,107.64
New Jersey	19,539	3,307,706.49
New Mexico	1,714	313,100.07
New York	72,443	12,708,724.41
North Carolina	3,594	629,741.43
North Dakota	1,696	309,986.70
Ohio	82,895	15,080,951.76
Oklahoma	11,597	2,072,265.44
Oregon	8,187	1,346,558.46
Pennsylvania	82,300	14,292,762.69
Rhode Island	4,739	803,094.77
South Carolina	1,805	285,004.28
South Dakota	4,856	882,568.71
Tennessee	16,613	3,226,403.16
Texas	8,755	1,356,249.45
Utah	1,053	183,669.41
Vermont	6,870	1,364,726.97
Virginia	8,095	1,435,649.79
Washington	10,752	1,817,748.90
West Virginia	11,188	1,988,371.53
Wisconsin	21,920	4,105,528.10
Wyoming	932	161,726.43
Total	854,622	151,985,425.89
INSULAR POSSESSIONS.		
Guam	3	627.72
Hawaii	82	13,798.80
Philippines	81	12,210.92
Porto Rico	41	6,178.00
Total	207	32,815.44
FOREIGN COUNTRIES.		
Algeria	1	108.00
Argentina	15	2,661.15
Australia	101	17,918.43
Austria-Hungary	37	6,564.17
Azores	6	852.90
Bahamas	3	642.00
Barbados	2	255.27
Belgium	24	4,257.84
FOREIGN COUNTRIES—continued.		
Bermuda	5	$1,044.00
Bolivia	1	180.00
Brazil	4	744.00
British East Africa	1	144.00
British West Indies	3	402.00
Bulgaria	1	144.00
Canada	2,749	487,754.09
Cape de Verde Islands	1	96.00
Chile	12	2,128.92
China	16	2,848.00
Comoro Islands	1	90.00
Costa Rica	4	618.00
Cuba	62	10,999.42
Danish West Indies	2	288.00
Denmark	49	8,696.09
Dominican Republic	2	288.00
Dutch West Indies	6	900.00
England	477	84,624.57
Egypt	2	234.00
Fiji Islands	1	120.00
France	74	13,128.34
Germany	522	92,608.02
Greece	8	1,755.55
Guatemala	3	366.00
Haiti	1	216.40
Honduras	2	324.00
Hongkong	3	525.00
India	16	2,838.56
Ireland	453	80,366.73
Isle of Man	2	378.00
Isle of Pines	2	432.00
Italy	60	10,644.60
Jamaica	7	1,332.00
Japan	34	6,031.74
Korea	1	180.00
Liberia	7	916.00
Madeira	1	276.00
Malta	2	180.00
Mexico	186	32,998.26
Netherlands	10	1,510.67
Newfoundland	4	612.00
New Zealand	15	2,670.00
Nicaragua	2	255.50
Norway	76	13,520.50
Panama and Canal Zone	40	6,768.66
Paraguay	1	240.00
Peru	13	2,288.30
Portugal	3	641.40
Russia	18	3,176.40
Salvador	1	144.00
Samoa	1	96.00
Scotland	85	15,079.85
Seychelles Islands	1	144.00
Siam	1	108.00
South Africa	10	1,780.00
Spain	3	398.80
St. Helena	1	144.00
Sudan	1	204.00
Sweden	80	14,192.33
Switzerland	70	12,418.70
Tasmania	2	288.00
Tonga Islands	1	180.00
Turkey	20	3,548.13
Uruguay	3	888.00
Venezuela	1	144.00
Wales	30	5,322.60
Total	5,465	967,863.89

REPORT OF THE COMMISSIONER OF PATENTS.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., October 25, 1912.

SIR: I have the honor to submit herewith the following report of the business of the United States Patent Office for the fiscal year ended June 30, 1912:

WORK OF THE YEAR.

Applications received during fiscal year ended June 30, 1912.

Applications for patents for inventions	69,236
Applications for patents for designs	1,775
Applications for reissues of patents	195
Applications for registration of trade-marks	7,238
Applications for registration of labels	941
Applications for registration of prints	362
Total applications	79,747
Disclaimers	12
Appeals on the merits	1,700
Total applications, disclaimers, and appeals	81,459

Applications for patents for inventions.

Year ended June 30—		Year ended June 30—	
1903	49,199	1908	58,527
1904	50,321	1909	62,800
1905	52,323	1910	63,365
1906	55,619	1911	65,154
1907	56,514	1912	69,236

Applications for patents, including reissues, designs, trade-marks, labels, and prints.

Year ended June 30—		Year ended June 30—	
1903	54,256	1908	68,441
1904	55,468	1909	73,026
1905	66,228	1910	72,533
1906	68,881	1911	74,677
1907	66,795	1912	79,747

Applications awaiting action.

Applications awaiting action on the part of the office, July 1, 1912	21,059

Applications awaiting action on the part of the office.

Year ended June 30—	
1908	20,043
1909	17,153
1910	14,575
1911	17,809
1912	21,059

Patents withheld and patents expired.

Letters patent withheld for nonpayment of final fees	6,970
Letters patent expired	19,634
Applications allowed, awaiting payment of final fees	14,415

Patents granted and trade-marks, labels, and prints registered.

Class.	1908	1909	1910	1911	1912
Letters patent	34,003	34,332	36,287	33,513	34,220
Design patents	748	721	629	777	1,148
Reissue patents	151	162	142	138	171
Trade-marks	6,135	4,547	4,342	3,791	4,635
Labels	636	779	176	576	625
Prints	279	231	59	181	268
Total	41,952	40,772	41,635	38,976	41,067

Receipts from all sources.

Applications, first fees	$1,029,900.00
Designs	32,170.00
Reissues	5,790.00
Trade-marks	71,606.00
Final fees	692,530.00
Appeals	19,175.00
Disclaimers	110.00
Coupons	48,453.30
Drawings	6,219.13
Recording assignments	47,184.98
Official Gazette and other publications	19,271.20
Labels	4,910.00
Prints	1,884.00
Court costs	15.00
Copies of patents [1]	49,752.85
Copies of records	65,221.94
Total [1]	2,094,193.40
[1] Less refundments on account of caveat fees and unapplied fees received during fiscal year 1910–11	133.90
Total receipts	2,094,059.50

Expenditures.

	Expended.	Estimated liabilities.	Total.
Salaries	$1,305,334.31		$1,305,334.31
Scientific library	843.86	$1,648.54	2,492.40
Postage on foreign matter	733.56		733.56
Stationery	10,394.90		10,394.90
Ice	574.66		574.66
Telephones	942.67		942.67
Washing towels	133.23		133.23
Furniture and sundries	20,125.53		20,125.53
Law library	203.35	261.90	465.25
Photolithographing, paid contractor	110,701.69		110,701.69
Photographic printing, paid contractor	7,506.54		7,506.54
Printing old specifications, paid Public Printer	21,791.77		21,791.77
Printing and binding:			
Official Gazette and indexes	150,025.24		150,025.24
Specifications	358,718.85		358,718.85
Miscellaneous	35,121.70		35,121.70
International Convention for Protection of Industrial Property		750.00	750.00
Total	2,014,561.17	4,674.84	2,025,912.30

[1] During the year copies of patents to the value of $114,808.95 were furnished, $65,056.10 worth of copies being furnished upon coupons, many of which had been sold in preceding years.

Receipts and expenditures.

Receipts from all sources	$2,094,059.50
Expenditures	2,025,912.30
Net surplus	68,147.20
Total net surplus to date	7,132,072.96

Comparative statement.

June 30—	Receipts.	Expenditures.
1903	$1,591,251.04	$1,423,094.40
1904	1,663,879.99	1,469,124.40
1905	1,737,334.44	1,472,467.51
1906	1,811,297.84	1,538,149.40
1907	1,859,592.89	1,584,489.70
1908	1,874,180.75	1,608,292.01
1909	1,975,919.97	1,887,443.35
1910	2,022,043.26	1,953,549.76
1911	1,987,778.58	1,957,001.85
1912	2,094,059.50	2,025,912.30

As specified in the foregoing statement, there were received in the last fiscal year 69,236 applications for mechanical patents, 1,775 applications for designs, 195 applications for reissues, 7,238 applications for trade-marks, 941 applications for labels, and 362 applications for prints.

There were 35,539 patents granted, including reissues and designs, and 4,635 trade-marks, 625 labels, and 268 prints were registered.

The number of patents that expired was 19,634. The number of allowed applications which were by operation of law forfeited for nonpayment of the final fees was 6,970. The total receipts of the office were $2,094,059.50. The total expenditures were $2,025,912.30, and the net surplus of receipts over expenditures was $68,147.20. The grand total of net surplus of receipts over all expenditures is now $7,132,072.96.

It will be noted from the foregoing tables that the volume of business has materially increased during the last fiscal year. The total number of applications for patents for inventions, for designs, for reissue of patents, registration of trade-marks, registration of labels, and registration of prints, disclaimers to patents, and appeals on the merits is 81,459. The total of all applications for the fiscal year immediately previous was 76,383 for the same period, which shows an increase of 5,076 applications received.

The number of applications for mechanical patents shows an increase of 4,082 over the previous fiscal year, or 6.26 per cent, an increase for the 10 years since 1903 of 40.72 per cent.

It will also be observed that the receipts of the office from fees for applications have been greater than preceding years, which clearly indicates the very marked prosperity of the country, as the activities in inventions and all things pertaining to them is a sure barometer of the financial condition of the country.

The condition of this office is fairly good considering the great handicap represented by the insufficient force and inadequate salaries and the want of sufficient room and proper equipment with which the work of the office can be carried on.

The number of appeals has also necessarily increased, consequent upon the increased volume of work. The number of cases appealed and heard and disposed of by the three appellate tribunals of the office and the Court of Appeals of the District of Columbia in patent cases is shown in the following table:

Appellate work.

Number of interferences declared	1,642
Number of interferences disposed of before final hearing	1,241
Number of interferences heard	239
Number of interferences disposed of	284
Number of interferences awaiting decision	54
Appeals to examiners in chief in interference cases	176
Ex parte appeals to examiners in chief	933
Total	1,109
Number of appeals in interference cases disposed of	143
Number of ex parte appeals disposed of	694
Total	837
Interference cases awaiting action	111
Ex parte cases awaiting action	532
Total	643
Appeals to commissioner in interference cases	100
Appeals to commissioner in opposition cases	13
Appeals to commissioner in cancellation cases	4
Ex parte appeals to commissioner	173
Interlocutory appeals to commissioner	245
Ex parte appeals in trade-mark cases	68
Total	603
Petitions to commissioner	2,600
Total	3,203
Number of cases disposed of by commissioner:	
Appeals in interference cases	110
Appeals in opposition cases	13
Appeals in cancellation cases	1
Ex parte appeals	174
Interlocutory appeals	243
Ex parte appeals in trade-mark cases	55
Total	596
Petitions to commissioner	2,599
Total	3,195
Appeals to Court of Appeals, District of Columbia:	
Ex parte cases	34
Interference cases	55
Opposition cases	4
Cancellation cases	2
Total	95

* * * * * * *

COLLECTIVE TRADE-MARKS.

In the International Convention for the Protection of Industrial Property, signed at Washington, June 2, 1911, which under the terms of the convention is to become effective April 1, 1913, by the countries which have ratified the same, it having been ratified by the United States, there was contained the following provision:

ARTICLE 7½. The contracting countries agree to admit for filing and to protect marks belonging to associations, the existence of which is not contrary to the law of the country of origin, even if these associations do not possess an industrial or commercial establishment.

Each country shall be the judge of the special conditions under which an association may be admitted to have the marks protected.

Pursuant to this provision of the convention the President, on January 13, 1912, directed that a measure be prepared for transmission to Congress which would be adapted to fulfill the terms of this article of the convention of Washington. This was done and sent forward to the President through your office. On February 2, 1912, the President in a message to Congress directed the attention of Congress to the necessity for this legislation, and it is believed that a copy of that proposed bill prepared by me was transmitted with that message to Congress by the President.

The bill as prepared provided that the act approved February 20, 1905, as amended, be further amended by the addition to section 1 thereof the following paragraph:

Where any association or any union of workmen undertakes the examination of any goods in respect of origin, material, mode of manufacture, quality, accuracy, or other characteristic and service and certifies the result of such examination by a mark used upon or in connection with such goods in commerce with foreign nations or among the several States of the United States or with Indian tribes, such association or union of workmen may register the mark as a trade-mark in respect to such goods upon compliance with the provisions of the act of February 20, 1905, as amended, whether or not such association or union of workmen be a trading association or trader or possessed of a good will in connection with such examination and certifying. When so registered such mark shall be deemed in all respects to be a registered trade-mark, and such association or union of workmen the proprietor thereof: *Provided, however*, Such trade-mark shall not be transferable or assignable.

So far as I am aware this bill has never been introduced in Congress, although the necessity for the same is apparent. Laws for the enforcement of collective marks are in force in European countries, and the draft of the bill which was submitted to the President conforms substantially in terms to the provisions of law upon this subject found in the British Trade Mark Act of 1905.

* * * * * * *

INDEPENDENT BUREAU DESIRABLE.

I have long been of the opinion that since the opinion of the Supreme Court in the case of Butterworth *v.* United States ex rel. Hoe and others (112 U. S., 50), which made the decision of the commissioner final within the office, thus doing away with appeals to the Secretary of the Interior, the connection of the Patent Office with the department is so slight that it would seem that its separation and establishment as an independent bureau is eminently desirable. Such a step would not only place the Patent Office upon

a more stable footing with regard to the exercise of the powers of the commissioner invested in him by law, but would relieve the department of the physical burden of caring for and appropriating for the bureau.

I believe that the establishment of the Patent Office as an independent bureau would be a step in the direction of progress and that it is also in the interest of efficiency and economy. Its duties as an office are purely judicial in character with such incidental clerical work as is necessary to carry them out; it requires in its employees special training along scientific and legal lines, and such employees are difficult to obtain and to retain in service, except at salaries higher than those paid to the other employees of the department; and the Patent Office has always suffered by reason of the failure of Congress to make the provision necessary. If good results are to be obtained, everything possible should be done to insure the independence, efficiency, and permanence of tenure of the entire force of the Patent Office. The Patent Office has nothing in common with the other bureaus of the Interior Department or of any other department. There is no appeal to the Secretary of the Interior on any question relating to the grant of a patent, and all appointments to positions in the Patent Office, except such as are Presidential, are made upon the nomination of the Commissioner of Patents, approved by the Secretary. The desirability of this change in the status of the Patent Office is recognized and provided for in a bill introduced by Mr. Oldfield, chairman of the House Committee on Patents of the House of Representatives, on April 16, 1912, and known as H. R. 23417. The subject was also ably discussed by the late Senator O. H. Platt, of Connecticut, one of the best posted men on the character of the work of the Patent Office and its needs who ever sat in either House of Congress, in a speech delivered in the Senate on March 31, 1884, and from which I quote the following extracts:

> I say that the Patent Office should be made an independent department, not only because of the vast importance of the interests which it must care for, but because of the treatment which it has received and must continue to receive as long as it remains a subordinate branch of the Interior Department.
>
> * * * * * * *
>
> What should be the qualifications of the head of the Patent Office? He should combine an accurate and almost universal knowledge of mechanical principles with a thorough knowledge of patent law and with rare executive and administrative ability. He should be preeminently distinguished for these qualities. His position should be one of entire independence. It is more judicial than executive. His duties are more like those of a judge of a court than an executive officer; they are purely judicial and ministerial. The office should be permanent and it should be nonpolitical, by which I mean it should have no political significance.
>
> * * * * * * *
>
> Every year's experience adds greatly to the capacity and ability of the Commissioner of Patents. In a word, the Patent Office needs and demands better administration, and it never will have it, as a rule, until it shall be made a separate department. It must be held in entirely different estimation by Congress and by public sentiment before it will be what it ought to be. The way to secure this estimation by Congress, the way to secure for it what it wants and what it needs and what it must have if it is properly to discharge the high functions which devolve upon it, is to separate it entirely from any supervision by the Secretary of Interior, to make it independent and dignified.

The Interstate Commerce Commission is pointed to as an independent bureau which is doing excellent work for the commercial progress of the nation, and the Library of Congress is another example

of a bureau working independently which is successfully organized and directed. In my opinion the judicial functions of the Patent Office should be as carefully safeguarded as those of the courts.

* * * * * * *

Respectfully submitted.

EDWARD B. MOORE,
Commissioner of Patents.

STATEMENT OF THE COMMISSIONER OF EDUCATION.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, September 3, 1912.

SIR: I have the honor to submit the following statement of the operations of this office for the fiscal year ended June 30, 1912.

DIVISION OF HIGHER EDUCATION.

The work of this division for the year has proceeded along four lines—routine statistical work, the preparation and publication of special bulletins or circulars, the supervision of the finances and administration of the land-grant colleges so far as these are related to Federal funds, and the field work of the two specialists in the division.

The results of the collection of statistics and other data relating to colleges, universities, technological schools, professional schools, and normal schools are presented in the annual report of the Commissioner of Education. There have been prepared, also, the annual bulletin giving the segregated statistics of State universities and other institutions of higher education partially supported by the State, and a pamphlet giving the "Federal laws, regulations, and rulings affecting the land-grant colleges of agriculture and mechanic arts." A tentative, proof-sheet circular of classification of universities and colleges with reference to the bachelors' degrees was also issued in a limited edition. The investigations made in preparation for the latter circular have continued through the year incidentally with other work, in anticipation of the issue of a revised edition as originally contemplated.

The two specialists of the division have carried on without interruption their inspection of the finances, organization, and administration of institutions receiving Federal aid under the acts of Congress of 1862, 1890, and 1907. Forty institutions were visited, several of them for the first time. Irregularities in the application of these Federal grants have been discovered and steps taken for remedying them promptly, as, for example, in the case of five States which are receiving on their investment of funds arising from the land grant less than the 5 per cent required by the act of July 2, 1862. The results of this close inspection demonstrate anew the wisdom of the policy of active personal supervision. The reports required to be made by institutions receiving Federal aid under the acts of Congress of August 30, 1890, and March 4, 1907, were duly received and examined by this office and it was found that, with the exception of a

single State, the expenditures had been made for the purposes specified in the acts.

The field work of the specialist in higher education has expanded in a gratifying manner. By the terms of an agreement made in November, 1910, with the National Association of State Universities, he has this year devoted a large part of his time to a study of the State university problem, inspecting the equipment, organization, and work of 16 State universities, and preparing a report upon each. Along with these visits to State-supported universities, nine privately endowed colleges and universities, in every case by their own request, have been examined by the specialist with a view to making helpful suggestions to them as well as bettering his knowledge of their aims and efficiency. The State of Oregon through its department of public instruction, in accordance with an act of the legislature in 1911, asked and received the services of the specialist as an expert in standardizing the colleges and universities of that State. The State of Virginia, after a similar investigation at the request of the Virginia Education Commission, received a detailed report upon the five institutions of higher education receiving financial support from that Commonwealth. A large extension of these opportunities to serve the States and their institutions in this advisory capacity may be expected.

DIVISION OF SCHOOL ADMINISTRATION.

During the year the division prepared four chapters and a portion of a fifth chapter in the Commissioner's annual report; 19 legislative circulars, one each week, were issued during the winter months, giving an account of the educational matters passed upon by the various State legislatures then in session; also 7 city circulars treating various subjects of immediate interest to city school administrators. The subjects of these circulars are: "Comparison of the educational provisions of the present and of the proposed 'Gaynor' charter of New York City;" "Vacation schools—regular school work;" "Industrial education in Cincinnati;" "Changes made in the public-school systems of certain cities;" "Digest of State laws, school board regulations, and judicial decisions relating to high school fraternities;" "Abstracts from New York City report, 1911;" "Dental inspection and instruction in oral hygiene." Three bulletins were completed, one of which deals with city school systems, one with State school systems, and another with both State and city systems. The subjects of these bulletins are as follows: "Teachers' certificates issued under general State laws and regulations;" "A study of expenses of city school systems;" "A comparison of urban and rural school statistics."

The division continued its cooperation with various national and State agencies for the promotion of educational administration. Together with the Committee on Uniform Records and Reports of the Department of Superintendence of the National Education Association, the bureau has been able to initiate an important and far-reaching movement in the keeping by the several school systems in the United States of uniform school records, fiscal and attendance, and in the uniform reporting of the same. The final report on this subject was adopted by the Department of Superintendence in Feb-

ruary, 1912, and it now remains for the bureau to promote the general adoption of the forms as drafted. The division has taken an active part also in securing wider recognition among the various States of the higher classes of teachers' certificates. This work, which is carried on in cooperation with the conference of chief State education officers, is not yet completed.

The division has also kept in close touch with the work of the Committee of the National Education Association on Teachers' Salaries and Cost of Living, and has prepared considerable material for its use. Close relations with the Department of Superintendence of the National Education Association have made it possible for the division to serve more adequately the needs of the members of the association.

The number of city school reports, rules and regulations, directories, and other city publications in the office files is greater than ever before. A card catalogue of all of them has been made, and approximately 125 of the more important and representative city reports have been carefully indexed upon cards classified by subjects for use in answering inquiries and in the preparation of publications of the bureau. The complete file of State reports, bulletins, and directories, of school and session laws, and of such codes as are not in the Land Office library, which is easy of access, is also worthy of note. The division is more fully prepared than ever before, as far as its equipment is concerned, to carry on all forms of investigation which involve State, city, or rural public school administration.

DIVISION OF SCHOOL HYGIENE AND SANITATION.

This division was created by an order of October 19, 1911. The purpose set forth in the establishment of the division included the following:

1. To furnish to all who seek it information regarding the sanitary construction of school buildings.
2. To bring together at the bureau information relating to school hygiene and sanitation and to render this information accessible to school authorities and all others interested.
3. To gather and prepare for publication information concerning the hygienic condition of school buildings and grounds throughout the country.
4. To conduct all correspondence referred to it wherein advice and information are sought on matters of school hygiene and school sanitation.
5. To prepare bulletins on such special topics as the commissioner may from time to time direct.
6. To direct such cooperative investigations as shall be made in connection with the bureau on matters relating to the hygiene of school children.
7. To compile and send out bibliographies on special topics in school hygiene, school sanitation, and medical inspection.
8. To assist in any other work connected with the bureau which the commissioner may see fit to assign to the division.

The work undertaken and thus far accomplished by this division is as follows:

1. It has answered all correspondence referred to the bureau relative to the construction of school buildings, both public and private, and its help has been sought by school boards and school officers in general from many parts of the country. Accordingly, aid has been given by advising in the planning, location, and construction of school buildings of all kinds.

2. Extensive annotated bibliographies on the following topics have been compiled and sent out on the request of teachers, school officers, and others interested:

The hygiene of child development.
Medical inspection of school children.
Medical inspection methods in the United States.
Medical inspection records.
Open-air schools and classes: Costs, plans, and results.
Playgrounds: Selected list of references.
Rural school grounds.
Sanitary science and public health education.
School gardens: United States.
Schoolhouses.
School hygiene.
The school janitor.
Schoolrooms: Color schemes.
Sex instruction of school children.

3. A comprehensive plan has been undertaken to prepare an annotated card index of all the most important literature available in the library of the bureau and elsewhere bearing on questions of school hygiene and school sanitation and other topics having to do directly with the health of school children and with school architecture.

4. The division has undertaken to prepare, in connection with the Fifteenth International Congress on Hygiene and Demography, to be held in Washington the latter part of September, 1912, an exhibition on school hygiene. This work has required much labor and extensive correspondence, but a creditable exhibition is now assured.

5. An intensive survey of the hygienic condition of rural schoolhouses and premises in two selected counties in each of 19 States has been completed. This survey was made with the cooperation of the State superintendents, the county superintendents, and the rural teachers. More than 3,300 personal letters and inquiries were sent out, and the returns from these have been collated and interpreted. The results of this study will be published later in the form of a bulletin.

6. A plan for cooperation has been effected with the various State boards of health, so that the bureau receives all current publications of these boards, and in return is furnishing them, through this division, with such special information as they may severally seek.

7. A special attempt has been made through the cooperation of competent architects from different parts of the country to prepare miniature models of country schoolhouses, made up in "knockdown" form, so that duplicates of these may be made and forwarded to school authorities in order to introduce better types of country school buildings.

8. The chief of the division has made personal investigations into the hygienic conditions of schools in various parts of the country, has counseled with school boards and school officers, and has delivered numerous public addresses on various topics of school hygiene and sanitation.

9. Bulletins are in course of preparation on the following topics:

(*a*) The rural schoolhouse and its environment.
(*b*) Bibliography (annotated) of school hygiene and school sanitation.
(*c*) Medical inspection of school children.
(*d*) Some types of new American schoolhouses.

DIVISION OF RURAL EDUCATION.

This division was created by an order of November 1, 1911, to have charge of the investigation of problems relating to rural schools. It was placed under the immediate supervision and direction of the Commissioner, with the assistant in rural education in charge as acting chief.

Since its organization the division has devoted the larger part of its energies to an investigation concerning the status of rural education in the United States, information being secured through published school reports, State documents, and by personal inspection of rural schools. A report is being prepared which will give the results of the investigation. The division is collecting information relative to the best rural school work in the country. It has affiliated with it 37 special collaborators, each appointed at a nominal salary, to cooperate with the division in keeping it in touch with the best things being done in rural education. These collaborators are all persons whose work is directly connected with rural education, either in State departments of education, normal schools, or as county superintendents, and they are widely distributed throughout the country. Several of them are making special studies for the division of some phase of rural education, the results of which will be published by the bureau if they prove to be of sufficient national interest and value to warrant publication.

* * * * * * *

STATISTICAL DIVISION.

The Commissioner's annual report for 1911 includes educational statistics collected, tabulated, and summarized by this division. Reports were received from—

10,234 public high schools.
1,979 private high schools.
477 summer schools.
363 manual and technical training schools.
600 commercial schools.
388 negro schools.
115 State reformatories.
53 institutions for the blind.
130 institutions for the deaf.
45 institutions for the feeble-minded.

In addition to tabulating the above 14,384 returns, the division made a special tabulation of 10,068 public high-school returns, which, together with the statistics of private high schools, will appear in detail in a bulletin now in the hands of the printer. To obtain this material it was necessary to send out 42,881 schedules in separately addressed envelopes, second and third requests being necessary in thousands of cases. In addition, a special inquiry concerning the teaching of agriculture was sent to 3,937 high schools. Also a special

request was sent to 14,000 public and private high schools to obtain lists of teachers and pupils, which work, including the receipt, arrangement, and classification of the returns, consumed at least one month's time of the entire division.

In addition to sending out the 60,818 requests mentioned above, the division prepared the mailing slips for about 9,000 copies of the annual report, writing about 18,000 addresses.

The work of preparing special statistics in answer to correspondents has been unusually heavy during the year, requiring on the average all the time of one clerk.

* * * * * * *

THE ALASKA SCHOOL SERVICE.

During the fiscal year ending June 30, 1912, the field force of the Alaska school service consisted of 5 superintendents, 110 teachers, 7 physicians, 7 nurses, 2 contract physicians, and 2 hospital attendants. Eighty-six public schools were maintained with an enrollment of 4,018 and an average attendance of 1,805.

Without neglecting the work in the schoolrooms and the sanitary work in the villages, during the year special attention has been given to the medical work among the natives, which includes the maintenance of hospitals at Juneau and Nushagak under the direct management of the Bureau of Education, contracts with the Holy Cross Hospital at Nome and the Fairhaven Hospital at Candle for the treatment of diseased natives upon the application of a superintendent or teacher in the Alaska school service, the employment of 7 physicians in hospital work and in relieving distress among the natives in their districts, the employment of 7 nurses in the hospitals, and in hygienic and sanitary work in the native schools and villages, also furnishing the teachers with medicine chests and simple instructions to enable them to treat minor ailments. Of the appropriation for education in Alaska, $24,926.04 was expended in the medical work outlined above.

During the summer of 1911 Passed Asst. Surg. Milton H. Foster, of the Public Health and Marine-Hospital Service, made a preliminary investigation of health conditions among the natives of southern Alaska with a view to inaugurating adequate measures for their relief. One of Dr. Foster's recommendations was the extension of the medical work in connection with the Alaska school service. In pursuance of this recommendation and in order that the entire medical work among the natives of Alaska might have expert supervision, upon the request of the Secretary of the Interior, the Surgeon General of the Public Health and Marine-Hospital Service in March, 1912, detailed Passed Asst. Surg. Emil Krulish for service in Alaska for an indefinite period under the direction of the Commissioner of Education. With the consent of the Secretary of the Treasury, the duties of Dr. Krulish for the Bureau of Education will be (a) to supervise all measures for the medical and surgical relief of the natives of Alaska, (b) to act as instructor to the teachers of the United States public schools in Alaska in all matters pertaining to the sanitary education of the natives, (c) to give instructions to teachers in first aid to the injured or sick, and (d) to act in a general

advisory capacity to the superintendent of education of natives of Alaska in all matters pertaining to sanitation, hygiene, maintenance of hospitals, and other matters of like character. The plans for the work of Dr. Krulish in Alaska include prescribing and enforcing regulations for the prevention and spreading of disease in the native villages.

During the summer of 1911 information was received that smallpox had broken out among the natives in the vicinity of New Rampart House, north of the Arctic Circle, near the boundary between Alaska and Canada. Under instructions from the Bureau of Education, the superintendent of schools in the Upper Yukon district proceeded to the infected district to render all possible assistance in suppressing the epidemic. Finding that the disease was confined to Canadian territory, upon the suggestion of the governor of Alaska and in accordance with instruction from the Commissioner of Education, he maintained a quarantine station near the mouth of the Porcupine River, in Alaska, from August to October, 1911, which prevented the disease from entering the Yukon Valley. As a precautionary measure, the representatives of the Bureau of Education in the entire Yukon Valley were liberally supplied with vaccine points and vaccinated all natives in the vicinity of the schools.

For several years there existed a desire among the members of the Hydah Tribe living in the villages of Klinquan and Howkan to migrate, their principal objections to the village sites being an insufficient supply of pure water and the necessity of leaving their homes for several months in order to obtain work. During the autumn of 1911 these natives migrated to a new site on the west shore of Prince of Wales Island, about 20 miles from the post office of Sulzer, advantageously located with regard to hunting and fishing grounds. By Executive order a tract of approximately 12 square miles has been reserved for the use of this colony and such of the natives of Alaska as may settle within the limits of the reservation. The natives have chosen the name of Hydaburg for their new village. The Hydaburg Trading Co., with a capital stock of $5,000, has been organized to transact the mercantile business of the settlement. The Hydaburg Lumber Co. operates a sawmill, in the establishment of which the natives were aided by the Bureau of Education. A United States public school, under the Bureau of Education, opened in Hydaburg during September, 1911. The village has a population of 159.

When returning from its northern cruise the United States revenue cutter *Bear*, upon the request of this bureau, transported to Port Moller 44 Eskimos who were desirous of leaving the Nome region in order to settle near the better hunting and fishing grounds of the Alaskan Peninsula. It is hoped that a school can soon be established in this new settlement.

The eruption of Katmai Volcano in western Alaska, June 6, 1912, destroyed the homes of 98 natives, who were conveyed by the U. S. S. *Manning* to Ivanoff Bay, on the southern shore of the Alaskan Peninsula, selected as the site for a new village which will be under the supervision of the Bureau of Education. Materials for the construction of the houses to shelter these destitute natives and the most necessary articles for their use have been sent to them from Seattle.

The following is a summary of expenditures from the fund for education of natives of Alaska:

Expenditure from appropriation for education of natives of Alaska.

Appropriation	$200,000.00
Salaries in Alaska	97,624.84
Equipment and supplies	18,069.13
Fuel and light	15,615.94
Local expenses	1,959.15
Repairs and rent	4,605.68
Buildings	9,982.73
Medical relief	24,926.04
Destitution	1,457.10
Commissioner's office salaries	6,023.50
Seattle office salaries	6,216.67
Commissioner's office expenses	320.00
Seattle office expenses	1,132.04
Traveling expenses	11,266.38
Contingencies	800.80
Total	200,000.00

THE ALASKA REINDEER SERVICE.

Reports covering the fiscal year 1912 have been received from only a few of the reindeer stations. The latest complete statistics are those of the fiscal year 1911, according to which the total number of reindeer in Alaska, June 30, 1911, was 33,629, distributed among 46 herds. Of the 33,629 reindeer, 20,071, or 60 per cent, were owned by 460 natives; 3,951, or 11 per cent, were owned by the United States; 4,663 or 14 per cent, were owned by missions; and 4,944, or 15 per cent, were owned by Lapps.

During 1909 arrangements were made with the Department of Agriculture permitting the exportation of reindeer meat, hides, and horns, under proper certification by the representatives of the Bureau of Education. It was not deemed wise, however, to encourage such exportations until the herds had increased sufficiently to supply adequately the local needs of natives and white men. Information having been received that the herds now furnish an ample source of supply of fresh meat to the native villages and towns in their vicinity, it was decided that the exportation could begin. In October, 1911, the first shipment of reindeer meat left Nome for Seattle. It consisted of about 125 carcasses purchased by a cold-storage company from Eskimo herders. This shipment of approximately 18,750 pounds found a ready sale in Seattle. It is probable that the exportation of reindeer meat from Alaska will eventually become an industry of extensive proportions.

The following is a summary of expenditures from the fund "Reindeer for Alaska, 1911":

Expenditures from appropriation for reindeer in Alaska.

Appropriation	$12,000.00
Salaries of chief herders	520.00
Supplies	9,700.46
Establishing new herds	675.00
Contingencies	1,104.54
Total	12,000.00

MISCELLANEOUS.

The Commissioner has spent much of his time in the field, attending conventions of teachers, school officers, and others interested in education and working toward the solution of some of its many problems. He has visited schools of all kinds and grades and conferred with the responsible officers of State, county, and city schools and school systems, and has made about 200 public addresses in 24 States and Porto Rico.

Within the year two new divisions have been created in the bureau: The division of school hygiene and sanitation, October 19, 1911, and the division of rural education, November 1, 1911. The reports of the work of these divisions are included in this statement.

A series of careful and exhaustive studies of the development of popular education in the several States has been begun, and their results will be published from time to time as bulletins of this bureau. It is believed that these will aid in the further development of education and make easier the task of the future historian of education in this country.

To assist the Commissioner and the specialists in the bureau to keep in closer touch with rural education, industrial education, and the work in school hygiene and sanitation in different parts of the country and in obtaining such information about these as can not be had through formal reports and other ordinary means, 42 special collaborators have been appointed at the nominal salary of $1 a year. These collaborators are men and women working under such conditions as enable them to render valuable service to the bureau without interfering with their regular duties. Two of these, absent on leave from their regular duties in the institutions with which they are connected, now have desks in the office of the bureau and are preparing manuscripts to be published as bulletins. The appointment of other collaborators will be recommended from time to time until all parts of the country are represented in this way.

Pursuant to a call of the Commissioner, representatives of the departments of education of a large majority of the States met at St. Louis at the time of the annual meeting of the Department of Superintendence of the National Education Association in February, 1912, to discuss with him plans for a more effective cooperation of this bureau and the State departments in collecting statistics and other information pertaining to education. The unanimous and hearty approval of the general outline of plans submitted strengthens the hope that there may soon be such cooperation as will enable both this

bureau and the departments of education of the several States to make their reports more comprehensive and accurate.

The legislative, executive, and judicial appropriation bill for the year 1913, which has passed since the close of the fiscal year for which this statement is made, increases the lump-sum appropriation "for the investigation of rural education, industrial education, and school hygiene, including salaries," from $6,000 (1912) to $15,000. The larger part of the increase in this lump sum will be used for the salaries of additional specialists in rural education, to enable the bureau to give to the States and local communities a little more of the help so much needed in building up efficient rural school systems. Smaller portions will be used to extend the work of the division of school hygiene and sanitation and for special studies in industrial education.

RECOMMENDATIONS.

I renew my recommendations of a year ago (statement of the Commissioner of Education to the Secretary of the Interior for the fiscal year ended June 30, 1911) that provision be made—

1. For an Assistant Commissioner of Education, who should be a specialist in secondary education, and serve also as the chief of a division of high schools.
2. For additional specialists in higher education.
3. For a group of specialists in industrial or vocational education.
4. For a specialist and assistants in city school administration.
5. For a specialist in the history, theory, and practice of education, who shall serve as a director of investigations and give assistance to other specialists in the bureau and to students of education, committees, and commissions who apply to this bureau for help in their investigations.
6. To enable the bureau to carry on cooperative experiments in elementary and secondary education under varying conditions and in different parts of the country, the results of these experiments to be published by the bureau for the information of the people.
7. For additional clerks to carry on the present routine work of the office and such additional work of this kind as may become necessary because of the larger work planned, and for a sufficient appropriation for traveling expenses to enable the Commissioner and the specialists in the bureau to do their work effectively.

I recommend further—

1. That provision be made for additional specialists in rural education and in school hygiene and sanitation. The work which the bureau should do in these subjects is much larger than can be done by the present staff and with the appropriations now made for these purposes.
2. That the limitations on salaries which may be paid specialists in this bureau be removed, or made such that the continued services of competent men and women may be obtained. The bureau can never do effectively the most important work for which it was created until it can retain in its service men and women of learning, experience, working capacity, and expert knowledge such as will win for their opinions and utterances the respect of the leaders in all lines of educational thought and activity. This can not be done so long as salaries are limited to the low maximum which the law now permits to be paid in this bureau.

RECOMMENDATIONS IN REGARD TO ALASKA.

Adequate provision for the medical relief of the natives of Alaska is an urgent national duty. The use of part of the appropriation for education in Alaska for the suppression of disease among the natives is an emergency measure. This most important work should receive serious consideration and prompt action on the part of Congress. I would recommend a liberal appropriation for this purpose.

I also renew my recommendation for the passage of a compulsory school-attendance law for Alaska. That results commensurate with expenditures may be obtained, a law compelling regular attendance in the schools is needed.

All of which is respectfully submitted.

P. P. CLAXTON,
Commissioner.

To the SECRETARY OF THE INTERIOR.

REPORT OF THE DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY.

GEORGE OTIS SMITH, *Director.*

The appropriations for the work of the United States Geological Survey for the fiscal year 1911–12 comprised items amounting to $1,507,920. The plan of operations was approved by the Secretary of the Interior and a detailed statement of the work of the several branches and divisions of the Survey is presented on later pages of this report.

* * * * * * *

PROGRESS OF SCIENTIFIC WORK.

CONTRIBUTIONS OF ECONOMIC WORK TO "PURE SCIENCE."

Notwithstanding the growth of the Survey work along practical economic lines, scientific work has not been neglected. In fact, in the Geological Survey the scientific investigations are inseparable from the economic work, though the one or the other may predominate in purpose according to the needs of the particular research in hand. In any field economic work of the highest rank is impossible without full knowledge of the scientific laws and principles pertaining to the subject of the work; but as there is no application of geology which does not involve unsolved problems, some of them of the highest importance, the best knowledge available is nevertheless relative. It thus follows that the broad and searching observations which should accompany every piece of good economic work comprehend data that are eventually combined in the construction of new scientific hypotheses, some of which, as more observations accumulate, grow into established laws or principles that are in turn of the greatest practical consequence. Thus the detailed studies of the metalliferous deposits in one region or another bring to light

evidence from which to determine the genesis of the ores and the modes or conditions of their occurrence, and the economic inquiry becomes more intelligent and successful when once this new principle regarding the mode of an ore occurrence is understood.

On account of the plain duty of this Federal service to minister to the immediate needs of the various mining districts, it is not generally possible to concentrate and direct the observations to a series of regions systematically chosen as suited soonest to furnish the requisite data bearing especially on some particular scientific problem, however important and advantageous its solution may be; but nevertheless the data are gradually accumulated for the interpretation of many of these problems without sacrifice of the Survey's obligations to the public. An interesting illustration of the deduction of a principle from data so accumulated is found in the paper by W. H. Emmons on the enrichment of sulphide ores, the manuscript of which has been completed during this year. Another illustration of scientific results based on a long period of field studies, pertaining mainly to economic areas, is found in the pre-Paleozoic history of central North America, as described in the monograph by Van Hise and Leith on the geology of the Lake Superior region, which appeared during the year.

Among other long-term studies more distinctly scientific in character may be mentioned particularly the investigations, made under Mr. Vaughan's direction, of the formations of the southern Coastal Plain and Gulf embayment, which, though having an economic object, are yielding important contributions to our knowledge of the stratigraphy, physiography, and geologic history of this province; the work under the direction of Mr. Cross in the San Juan region of southwestern Colorado, which, in connection with the thorough geologic studies made during the preparation of folios, is affording new scientific results of a high order concerning especially the volcanism and physiography of the region; and the studies begun last year by Messrs. Campbell and Alden in the Glacier National Park, which promise important results concerning the origin of the structure and physiography of this part of the Rocky Mountains and of the glacial topography, which, as it is still "in the making," offers exceptional opportunities for scientific study as well as observation by the traveler interested in the natural wonders of his own country. Important regional studies of high scientific rank which should also be mentioned are those prosecuted by Mr. Keith and his associates, on the difficult stratigraphy and intricate geologic structure of the older Paleozoic regions of western New England and the Appalachian region, the results of which are partly published in folio texts, and those carried on by Prof. Emerson in southern New England. A report by Prof. Emerson on the geology of Massachusetts and Rhode Island has been submitted during the year.

PALEONTOLOGIC WORK.

The paleontologic work of the Survey continues to be of the highest rank. Many of its publications, written by the most distinguished representatives of the various branches of paleontology in the country and embodying experience and observations gathered

during years of patient research, have contributed much to the scientific reputation of the organization. The descriptive paleontologic papers are often treated as "pure science;" yet instructive, striking, or tedious as may be these delineations of the groups of animal or plant life which lived on the globe in some particular epoch, there is not one of these papers describing the fauna or flora of a formation that does not prove sooner or later to possess practical value and to be essential to geology in its constantly increasing refinement of study and results. Without paleontology the geologic classification of formations, their correlation, and the determination of their mutual relations would be impossible. In fact, real and symmetrical progress in geology is impossible without corresponding interrelated development and refinement of its handmaid paleontology. The economic geology of any region of complicated structure is blind and inconsequent unless the time relations of the strata concerned are known. The monograph now being issued from the press on the Cambrian Brachiopoda, prepared by ex-Director Walcott and representing many years of painstaking study and distinguished attainment, embraces our best and most complete presentation of the criteria for the discrimination of the Cambrian formations in America and will for many years be a manual for the use of workers in Cambrian geology and paleontology. This monograph brings deserved credit to American science and to the Geological Survey, under whose auspices most of the work was accomplished. Other paleontologic publications specially deserving mention by reason of their scientific merit are J. P. Smith's philoon the Mesozoic and Cenozoic Echinodermata of the United States by W. B. Clark and M. W. Twitchell, the manuscripts for both of sophic treatment of the Middle Triassic faunas, and the monograph which are now in hand. Works like that of Kindle on the Onondaga fauna, lately printed, and those by Berry on the Upper Cretaceous and Eocene floras of South Carolina and Georgia and by Stephenson on the Cretaceous deposits of the eastern Gulf region, both now in manuscript, are indispensable to geology. In these papers the stratigraphic value and the practical application of the results of the paleontologic investigations are given much prominence. The two papers last named are based on materials gathered in the course of the study of the Coastal Plain already mentioned, the economic motive for which was the investigation of the underground water resources. They are therefore representative of a series of scientific reports resulting from studies whose immediate object is economic.

WORK ON GEOLOGIC FOLIOS.

The folios describing and mapping in detail the geology of quadrangles in different parts of the country are regarded as mainly scientific, though always giving attention to the economic resources of the region. The areal studies now in progress in the valley region of central Alabama, a part of which has been described by Mr. Butts in the Bessemer-Vandiver and Montevallo-Columbiana folios, now in hand, promise important additions to the geologic history of the southern Appalachian region. On the other hand, the Claysville (Pennsylvania) folio, which has been issued during the year, affords

a striking example of the first-hand aid in oil and gas development to be derived from the careful delineation of geologic structure and its economic explanation. Not inferior in scientific value to the papers just cited, though primarily economic, are such reports as those by Messrs. Brooks and Prindle on the Mount McKinley region, Alaska, and by Messrs. Calkins and Emmons on the geology and ore deposits of the Philipsburg quadrangle, in Montana.

WORK IN LAND CLASSIFICATION.

An important and interesting effect upon the scientific work of the Survey has resulted from the work in land classification. The constantly increasing demand for both completeness and exactness of information regarding the mineral resources of the public lands under classification have developed methods and scope of view in this economic work that have exerted a marked influence on the folio work in other areas.

Thus, the training and methods developed in the course of the classification of the coal lands have brought about higher standards of refinement in stratigraphy, as well as in economic work, in other regions of the country. Another very notable illustration of scientific results springing from the study of economic problems is found in the administration of the Weeks Act. The intensive hydrometric experimental studies carried on in order actually to show, in accordance with the terms of the law, the degree of protection afforded by forests to soil and water in certain areas proposed for purchase as national forests have resulted in empirical determinations and demonstrations of high scientific value as well as of tangible economic importance.

WORK ON OIL AND GAS.

The principles governing the origin and mode of occurrence of petroleum and natural gas are as yet but fragmentarily grasped. Every oil field examined in detail contributes its data for use in the eventual interpretation of the problems, and each pool is studied with keen alertness for the discovery of some key which may aid in the coordination of the data, which sometimes, according to the region and conditions, seem, on acount of our lack of knowledge, even to be in conflict. The observations made by the Survey geologists in the oil and gas fields of California and Kentucky promise to further the solution of some of the problems, and by pointing out the relations of oil and gas occurrence to the geologic structure of the regions examined they have rendered important scientific as well as economic aid in oil and gas development; but the basic principles controlling the widely varied modes of occurrence and accounting for the differences in kinds of the oils in widely separated regions are possibly still far from view.

THEORETIC WORK BY SURVEY GEOLOGISTS.

On account of the more conservative and dignified character of the official publications of the Survey and the care taken to confine their substance to matters of demonstrated fact, they do not offer to

the geologists the forum for free discussion of scientific theories and problems that is afforded to those periodicals and serial publications of scientific societies which are especially devoted to matters of strictly professional interest and which are more widely distributed among scientists. For this reason many of the scientific results of the Survey's operations are first published in these journals. Examples of papers of high rank contributed in this way are numerous. Without implying relative merit among these, mention as typical may be made of the paper by Mr. Campbell, "Historical review of theories advanced by American geologists to account for the origin and accumulation of oil," published in Economic Geology, vol. 6, No. 4, and that by Mr. Ulrich, entitled "Revision of the Paleozoic systems," printed in the Bulletin of the Geological Society of America, vol. 22, No. 3. Besides contributing to the programs of other scientific societies in Washington, the members of the Survey maintain for the discussion of purely geologic topics three professional societies, including the Geological Society of Washington, before which Mr. Campbell's paper, just cited, was presented as a presidential address. Meetings of some one of these societies or of their sections average two a week for the winter and by far the greater number of the papers read are offered by members of the Survey.

EDUCATIONAL WORK OF THE SURVEY.

Closely connected with the scientific work of the Survey is its educational function, which has not on the whole received the attention that so importantly useful a work deserves. The Survey has, however, in cooperation with several State surveys, participated in the preparation of a number of educational bulletins that have, in accordance with the agreements, been submitted to the respective States for publication. As distinctly educational in their scope, though far from elementary, should be named the valuable paper by Mr. Willis entitled "Index to the stratigraphy of North America," published as a professional paper in explanation of the new geologic map of the continent, and the paper by Messrs. Tarr and Martin describing the earthquake phenomena in the region of Yakutat Bay, Alaska.

A notable contribution to the study of physiography was the Survey's Professional Paper 60, "The interpretation of topographic maps," by R. D. Salisbury and W. W. Atwood, consisting chiefly of reprints of parts of the Survey's maps and of brief suggestions as to the origin and history of the features shown on them. For many years the topographic maps made by the Survey have been regularly used in the courses of instruction in geography and physiography in most of the universities and colleges and to some extent in the secondary schools. It is very gratifying to note that the maps prepared in accordance with the present high standard, and more fully adapted to such use, are coming to the attention of teachers in the graded and country schools. Teachers of schools located in the quadrangles surveyed in recent years find the corresponding topographic sheets a most practical and invaluable aid to their efficiency and success in teaching elementary geography.

LAND-CLASSIFICATION POLICY.

Formal action was taken on May 1, 1912, giving the land-classification board the rank of an independent branch within the Geological Survey. This recognition of the increasing importance of this phase of the work of the bureau is in line with other developments in the present public-land policy, which has highest utilization as its purpose. The present epoch in public-land legislation and administration may be said to date from 1888, when Congress made special provision for an irrigation survey and authorized the withdrawal or reservation, pending further legislation, of the reservoir sites and irrigable lands designated as a result of special investigation by the Geological Survey. This legislation was simply the forerunner of the reclamation act of 1902, which is most notable as providing a practical means of insuring that the irrigable lands thus classified shall be put to their highest use, through a Federal agency, the Reclamation Service. In a somewhat similar way the act of June 4, 1897, marked the beginning of a national-forest policy of administration on a scale that later necessitated the organization of another technical corps, the Forest Service. The legislation of 1897 is interesting in this connection as providing specifically for examination and survey of forest areas by the United States Geological Survey for purposes of land classification.

During the last decade, however, "classification of the public lands," the first of the statutory functions of the Geological Survey, has come to take a large share of its activities. The field data accumulated as the result of three decades of geologic and topographic surveys, of stream measurement, and of detailed investigation of every mineral resource now contribute to putting into practice this business policy. In practice land classification means simply the determination of highest use. To encourage development and at the same time to enforce wise utilization by preventing partial or wasteful use is to protect the public interest. With the different values of the land made known by adequate examination, the highest use can be determined and, in so far as the statutes are in accord with economic law, the highest use can be assumed.

The scientific classification of the Nation's lands is now an integral part of the public-land administration. The field work of the geologist and the engineer is made to contribute to a business policy in the management of the Nation's real estate along three distinct lines. Quantitative knowledge of the land and its resources is now made a preliminary, first, to disposition of lands under the various settlement and development laws; second, to reservation of lands from present acquisition pending the enactment of adequate legislation; and third, to valuation of lands where the statute provides for disposition at prices expressing known value. For each of these phases a statement of the past year's work will best serve the purpose of illustration.

The determination of the character and the highest use of land for the purpose of disposing of it under the appropriate law includes its classification as mineral or nonmineral and as irrigable or nonirrigable. Upon the questions of fact as to mineral character depends the passage of title from the Government under the agricultural or mineral laws and the applicability of certain railroad nonmineral land grants. The total area classified for these purposes in

the fiscal year ended June 30, 1912, was one and a half million acres. The questions involving water supply on the public lands bear directly upon the administration of the statutes encouraging irrigation and dry farming, namely, the Carey Act and the desert-land and enlarged-homestead laws, as well as various right-of-way statutes. Upon the determination by field engineers of the quantity of water actually available for reclaiming the arid lands must wait the development of the remnant of agricultural lands in the public domain. Hydrographic classification of lands to serve this practical end aggregated last year more than 2,000,000 acres.

The second phase of activity in land classification is one that provides for future rather than present disposition of the public domain. The withdrawal act of June 25, 1910, looks forward to better utilization in the future and opens up the question of amendment of present laws by specific provision for reservation from immediate disposal of oil and gas and phosphate lands and of power and reservoir sites. Under the authority of the statute the Geological Survey during the fiscal year 1912 recommended the executive withdrawal of more than one and one-third million acres of oil reserves and almost one and one-fifth million acres of phosphate reserves, based on geologic data; of more than one-third million acres of water-power sites and 60,000 acres of irrigation-reservoir sites, based on hydrographic and topographic surveys; and of 86,000 acres of public water reserves essential to the control of public grazing lands. The areas of the outstanding withdrawals are approximately four and three-fourths million acres of public lands chiefly valuable for oil and gas, three and one-third million acres of phosphate lands, more than one and four-fifths million acres of lands essential to water-power development, nearly one hundred thousand acres primarily valuable for irrigation storage, and 86,000 acres of lands including springs or other watering places, unrestricted access to which, by the public, is essential in connection with the free use of the public range. The areas thus described as withdrawn, however, include tracts of privately owned land, which are in reality unaffected by the orders of withdrawal, although located in the larger legal subdivisions enumerated in those orders.

The third and most direct application of science to national stewardship is the valuation of the public coal lands. The coal-land law of 1873 is essentially a sales rather than a settlement law and provides for a minimum selling price. Since 1907 coal lands have been sold at appraised prices fixed by the Geological Survey on the basis of geologic field examination and chemical and physical analyses, valuation data of the latter kind being obtained from the Bureau of Mines, which is charged by its organic law with the analyzing and testing of coals and lignites.

WORK OF THE YEAR.

GENERAL INCREASE.

Although the appropriations made directly for the Geological Survey showed an increase of only $30,480 over those of 1911, there was a notable increase in the amount of work done by the field service. The funds available through cooperation with other Fed-

eral bureaus and with the States amounted in 1912 to 27 per cent of the direct appropriations and showed an increase over cooperative funds of the preceding year of 42 per cent. This increase in the field work involved a large increase in the work of the Washington office, to which was added the greatly increased service rendered the Secretary's Office, the General Land Office, and the Office of Indian Affairs in connection with public-land administration.

* * * * * * *

REPORT OF THE DIRECTOR OF THE BUREAU OF MINES.

JOSEPH A. HOLMES, *Director.*

PURPOSE OF THE BUREAU OF MINES.

The general purpose of the Bureau of Mines is to conduct, in behalf of the public welfare, fundamental inquiries and investigations into the mining industry. The two phases of the industry of greatest national concern are safety and efficiency—safeguarding the lives of our miners and insuring the most efficient and least wasteful development and use of our mineral resources.

These inquiries and investigations are national in scope; they do not contemplate the safeguarding of the life of the individual miner nor the promotion of the interests of the individual mine owner or operator, but seek the development of methods that will increase the safety of all miners and will promote the upbuilding and permanence of the whole mineral industry. Yet, although the advancement of the public welfare is the primary purpose of this work, it is obvious that broad fundamental inquiries and researches can not fail to confer benefits on the individual miner and the individual mine owner. Hence, the function of the Bureau of Mines may be defined as the conducting of inquiries and investigations that have for their purpose the improvement of health conditions, and the increase of safety, efficiency, and economic development in the mining, quarrying, metallurgical, and miscellaneous mineral industries of the country.

The scope of the investigations that the bureau has conducted is defined as follows in the act of Congress (36 Stat., 369) effective July 1, 1910, under which the bureau is established:

> It shall be the province and the duty of said bureau and its director, under the direction of the Secretary of the Interior, to make diligent investigation of the methods of mining, especially in relation to the safety of miners, and the appliances best adapted to prevent accidents, the possible improvement of conditions under which mining operations are carried on, the treatment of ores and other mineral substances, the use of explosives and electricity, the prevention of accidents, and other inquiries and technologic investigations pertinent to said industries, and from time to time make such public reports of the work, investigations, and information obtained as the Secretary of said department may direct with the recommendations of such bureau.

The Secretary of the Interior, by another section of the act, was authorized to transfer to the Bureau of Mines from the United States Geological Survey the analyzing and testing of coals, lignites, and other mineral-fuel substances, and the investigation as to the causes of mine explosions.

SOME BENEFITS FROM THE WORK OF THE BUREAU OF MINES.

The work of the Bureau of Mines has not been continued long enough to make possible any accurate measure of the benefits to come from it, but some of the benefits already apparent are mentioned below. In this connection large credit is to be given to many private individuals—engineers, operators, and miners—and to many State mine inspectors who have aided in bringing about these results.

IMPROVEMENTS IN MINE SAFETY AND IN MINING CONDITIONS.

It should be borne in mind that much of the work now under way in the Bureau of Mines was begun some two years prior to the establishment of the bureau and was transferred to it.

At the beginning of this work black powder, with its long, hot flame, was in general use throughout the coal fields of the country, even in mines where the presence of inflammable gas and dust rendered its use dangerous. The explosives investigations now under way by the bureau have been largely instrumental in bringing about the adoption, in these more dangerous coal mines, of a new type of explosives with a short and relatively cool flame. The use of this type of explosives, now generally designated "permissible explosives," has increased from a small beginning a few years ago to more than 13,000,000 pounds during 1911.

This revolution in the use of explosives in coal mining has not only aided in reducing the number of mine disasters, but also in reducing the number of individual accidents. Miners, mine operators, and mining engineers have expressed the opinion that the work of the bureau in investigating explosives has alone a value far greater than the entire cost of maintaining the bureau since its establishment.

There is still much to be accomplished in bringing this work in behalf of safety to a higher state of perfection, and it is of great importance that investigations should be conducted in connection with explosives for use in the metal mines and quarries of the country.

As regards the work of the bureau in investigating mine explosions, it may reasonably be claimed that much has been accomplished. This statement applies not only to the study of the prevention of explosions, but also to the study of means of limiting such explosions as may start, through unexpected inbursts of explosive gas or other causes not controlled by reasonable precautions, to certain rooms or sections of the mine, thus helping to reduce greatly the number of persons that might be killed by future explosions in spite of the preventive measures adopted.

Through the developments from the results obtained, there has been during the past two years a considerable reduction in the number of lives lost in the coal mines of the country from mine explosions.

The work of the bureau has called especial attention to the risks and the precautions that should be taken in connection with the use of electricity in mining, especially in mines where there is danger of explosions from the presence of gas or inflammable dust, or both. It has pointed out the dangers from the use of electric incandescent lamps in such mines and the types of lamps which can be used with a larger degree of safety; has indicated the types of electric motors

that should be used in such mines, and has called attention to the kinds of insulation that may best be employed in mines where the agencies destructive to insulation act most vigorously.

The precautions and other improvements recommended by the bureau are being adopted as rapidly as conditions permit, and already through its investigations and the cooperative efforts of mining engineers and mine owners the lessening of accidents from electricity in mines is becoming evident.

The investigations of the bureau in connection with accidents from falls of roof and of coal and from failure of mine equipment have been too few and too incomplete to justify any expectation of extended beneficial results at once; but the safety recommendations of the bureau, based on preliminary examinations, are already being adopted widely in the coal mines of the country.

The investigations of mine fires have resulted in making clear many of the contributory causes of such fires and have shown the proper equipment and methods for preventing and fighting fires. Especial attention has been given to the analysis of the atmosphere of fire areas as an aid in determining whether an area has been so sealed that outside air can not reach the fire, which, in such event, will be smothered. The findings of the bureau in this respect are proving of service to operators and to State mine inspectors.

The mine-rescue work, including both investigations and general demonstration and educational work, has been carried on in connection with the operations of the mine-rescue cars and mine-rescue stations and has already yielded worthy results. Some new methods have been adopted, and in the first-aid and the rescue methods several thousand miners have been given training that will prove useful to them and to their fellow miners in time of minor accidents or of great mine disasters.

In connection with such rescue work, some 20 lives have been saved by employees of the Bureau of Mines, and several additional lives have been saved by miners trained by the bureau through the operation of the mine-rescue cars and stations. Meanwhile, the general demonstrations and illustrated lectures given by the employees of the bureau in connection with the work of the cars have been attended by more than 200,000 miners in different parts of the country, and some 2,000 miners have been granted certificates as fully trained in mine-rescue and first-aid work.

Another important part of the movement for greater safety in mines to which the bureau has contributed largely is the organization of private mine-rescue stations, equipped and maintained at the coal mines by the larger operators. More than 1,500 sets of artificial breathing apparatus have been purchased and are now in use at such stations, and in addition a half dozen of the larger coal companies have equipped and are operating special mine-rescue cars for use at the groups of mines under their management. One of the States has equipped and is now operating three mine-rescue stations and three mine-rescue cars.

The investigation of certain miners' diseases, especially "miners' consumption," or miners' phthisis, and miners' hookworm, has been undertaken. Attention has already been called to methods which should be adopted looking to a large reduction or complete elimina-

tion of these diseases in mining camps where they prevail and to the preventive methods that should be employed in other mining camps where conditions are favorable to the development of these diseases.

This work has been carried on in cooperation with the Public Health Service, and if properly conducted can not fail to lead to immediate improvement in those mining conditions that are largely responsible for the spread of such diseases.

In this connection the Bureau of Mines has also taken up the study of those conditions in the larger metallurgical plants of the country that affect more or less adversely the health of the employees. Already the attention of those in charge of such plants is being called to the need as well as the nature of remedial measures.

It is encouraging to note that a beginning is being made in the reduction of the death rate from accidents in coal mining in the United States, as is shown by the tabular statement given below. It is not claimed that the lessening death rate indicated by this table was due wholly to these investigations, but doubtless they helped to bring it about, not only by bringing out new facts, but also by procuring the active cooperation of miners, mine owners, and mine inspectors in this movement.

Production, number of men employed, and number of men killed in and about the coal mines of the United States in the calendar years 1907 to 1911, inclusive.[a]

Year.	Production (short tons).[b]	Number employed.[b]	Production (short tons).[c]	Number employed.[c]	Number killed.			Production per death (short tons).
					Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1907	480,363,424	680,492	461,406,000	655,418	3,197	4.88	6.93	144,000
1908	415,842,698	690,438	404,933,000	672,794	2,449	3.64	6.05	165,000
1909	460,814,616	666,555	460,761,000	666,523	2,668	4.00	5.79	173,000
1910	501,596,378	725,030	501,596,000	725,030	2,840	3.92	5.66	177,000
1911	496,221,168	728,348	496,221,000	728,348	2,719	3.73	5.48	183,000
Total	2,354,838,284	3,490,863	2,324,917,000	3,448,113	13,873	.....	.....	.....
Average	470,967,657	698,173	464,983,000	689,623	2,775	4.02	5.97	168,000

[a] The figures for production and number of men employed are from "Mineral Resources of the United States," E. W. Parker, U. S. Geol. Survey except for the number of men employed in 1911, which were compiled by the Bureau of Mines.

[b] These figures represent the total production and the total number of employees in the entire coal-mining industry of the United States.

[c] These figures represent the production and the number of men employed in those States in which records of fatal accidents are in existence. The figures are directly comparable with the number of men killed as given in the fifth column and are those on which the mortality rates given herewith are based. It will be noted that the portion of the industry not represented in the rates for 1907–1909 is extremely small and that in 1910–11 the entire industry is covered.

MINE-SAFETY LAWS AND REGULATIONS.

In order to be able to meet frequent demands from the mining States for information concerning legislation that has been found necessary or beneficial, and the rules and regulations that have proved useful in safeguarding the lives of miners in different mining countries and States, a large amount of pertinent information has been already brought together by the bureau and is now being digested and supplied to the States for use as a basis for improved State legislation.

Much of this information is also sent direct to mine owners and miners for their own consideration in studying the possibilities of increasing safety in the mines of the different coal fields. This work has been under way for nearly three years and is generally considered one of the most useful phases of the work that the bureau has undertaken in behalf of mine safety.

SOME BENEFITS FROM FUEL INVESTIGATIONS.

The larger part of the coal now bought by the Government is purchased under the general technical supervision of the Bureau of Mines. The cost of purchases under specifications prepared by the bureau for the use of the Government now aggregates more than $5,000,000 per annum, and the additional fuel bought under the general advice of the bureau now aggregates in purchase cost some $3,000,000 per annum more, making the total value not less than $8,000,000.

The benefits to the Government from this work of the bureau have been both general and special. In the case of the purchase of coal by the Isthmian Canal Commission for the Panama Railroad during 1910 and 1911 the actual sum of money saved by the Government was nearly $75,000 and the real saving was probably several times these figures, because the method of purchase insured deliveries of coal of a higher grade than would otherwise have been obtained.

Similar benefits have developed each year in the case of fuels purchased by other branches of the Government service, though in no other individual case have the benefits been as large as in the case of the Isthmian Canal Commission.

The benefits to the general public resulting from this work for the Government may be indicated by the fact that more than 50 of the larger cities, a number of States, and a large number of private corporations and business concerns in different parts of the country have followed the general plans adopted by the Government for the purchase of its coal.

The analyses of coals occurring in different parts of the country, analyses that have been made in the testing of these coals for the use of the Government, have been of great service to engineers in charge of power plants and to manufacturing industries throughout the country, enabling users of fuel to determine in advance the character of the coals available for local or special use.

Still more important, probably, are the investigations carried on by the bureau looking to an increased efficiency in the burning of coal at the various power and heating plants of the public buildings of the Government in different parts of the country.

These investigations have not only resulted in recognized benefits to the Government itself, but also to power plants in cities and to private persons in many parts of the country.

Stimulated by investigations undertaken by the bureau a considerable briquetting industry has developed in a number of places, which is making decided progress in utilizing the slack or waste coal of the country by pressing it into briquets and thereby increasing its fuel value.

The utilization of fuels that have heretofore been considered waste products because of their being low grade and containing an excessively high proportion of ash has been much aided through the

Government's investigations in connection with the use of the gas producer for low-grade fuels.

In its preliminary investigation into the subject of waste of resources in the mining of coal and other mineral products, the bureau has already contributed to an awakening of public interest and an awakening of many of the mine operators of the country to the importance of a thorough examination into this subject. It is hoped that this examination can be made, for it will, if made, point the way toward more efficient and less wasteful methods of mining, handling, and utilizing the more important mineral resources of the country.

* * * * * * *

MINE-ACCIDENTS INVESTIGATIONS.

The investigations conducted by the bureau during the fiscal year 1912, like those of the preceding year, were devoted chiefly toward the prevention of large coal-mine disasters. The pressing need of investigations to determine the causes of and the means of preventing accidents in coal mines and in metal mines, and also the need of inquiries and investigations into the cause and the prevention of accidents and diseases incident to metallurgical and other mineral industries, was fully recognized, but in view of the limited funds at the disposal of the bureau for investigations it was deemed wiser to enlarge and push the investigations under way rather than to take up other investigations. New work was limited mainly to the collection of statistics of accidents in coal mines.

In the investigation of problems relating directly to efficiency and safety in the mining of coal good progress was made. Every mine in the United States at which an explosion or fire of any note occurred was visited by one or more engineers of the bureau who, in cooperation with or with the approval of the State or mine officials, investigated the cause of the disaster and rendered such aid as was possible in preventing further loss of life and resources.

In the endeavor to determine the underlying causes of mine explosions and mine fires and the means by which dangerous conditions may be most effectively prevented or abated other coal mines in many parts of the country were investigated.

In continuation of its investigations relating to the dangers that attend the use of electricity in coal mines the bureau has completed a series of tests to show how electric motors should be incased to render safer their operation in gaseous coal mines. It has conducted experiments that showed the possibility of igniting explosive mixtures of mine gases through the breaking of the bulbs of incandescent electric lamps in the presence of such gases, and it has made tests to ascertain the insulating materials best adapted for protecting miners or mill men from the danger of electric shock.

Tests and investigations to lessen the accidents attending the use of explosives in mining were continued at the Pittsburgh station and in the field. During the year 32 explosives were thoroughly tested and designated as "permissible" explosives for use in dusty and gaseous coal mines under the conditions prescribed by the bureau. On June 30, 1912, there were 88 explosives on this permissible list.

New tests were devised and the test requirements were made more rigid to insure greater safety in the use of the explosives that might pass the tests. In testing and analyzing the explosives examined during the year over 10,000 tests, analyses, and determinations were made.

At its experimental mine near Bruceton, Pa., about 13 miles southwest of Pittsburgh, the bureau has continued its study of coal-mine explosions. This mine consists of two entries driven from the outcrop into the Pittsburgh coal. It is equipped with apparatus for recording the speed of an explosion and the pressure produced and for automatically taking samples of the gases formed during an explosion.

At the end of the year the two main entries were in 980 feet from the outcrop. Improved instruments had been installed, and a series of 15 dust explosions had been made under predetermined conditions. The effect of different conditions on the violence of the explosions had been studied and a discussion thereof prepared for publication. The main purpose of the investigations at the mine is, of course, to discover the most efficient methods of preventing or limiting gas and dust explosions.

MINE-RESCUE CARS AND STATIONS.

To facilitate its investigations of mine disasters and to demonstrate the use of mine rescue apparatus and approved methods of rendering first aid to the injured, the bureau maintains six mine-rescue stations and seven mine-rescue cars in those of the larger coal fields in which mine disasters are most likely to occur. The stations are at Pittsburgh, Pa.; Urbana, Ill.; Knoxville, Tenn.: Seattle, Wash.; McAlester, Okla.; and Birmingham, Ala. The cars were distributed as follows:

Car 1, in the anthracite fields, with headquarters at Wilkes-Barre, Pa.

Car 2, in the coal fields of New Mexico, Colorado, and Utah, with headquarters at Trinidad, Colo., and Salt Lake City, Utah.

Car 3, in the coal fields of western Kentucky, Indiana, and Illinois, with headquarters at Evansville, Ind.

Car 4, in the coal fields of Wyoming, northern Colorado, and Utah, with headquarters at Rock Springs, Wyo.

Car 5, in the coal fields of Montana and Washington, with headquarters at Billings, Mont., and Seattle, Wash.

Car 6, in the coal fields of western Pennsylvania and northern West Virginia, with headquarters at Pittsburgh.

Car 7, in the coal fields of southern West Virginia, western Virginia, eastern Kentucky, and eastern Tennessee, with headquarters at Huntington, W. Va.

So many miners have desired to receive training in mine rescue and first-aid methods that the present training facilities are inadequate. By reason of insufficient supplies and equipment, these facilities were not operated during the year at more than 50 per cent of their maximum possible effectiveness.

Nearly 65,000 persons (mainly miners) visited the safety cars and stations; more than 36,000 miners attended the mine-safety lectures; more than 10,000 miners took partial training in rescue or first-aid work; and about 1,000 certificates were issued to miners showing proficiency in such work. Miners and operators in all coal fields have taken active interest in the demonstration work of the bureau, and

many operators have organized and equipped mine rescue corps at their own mines at their own expense.

MINE-SAFETY DEMONSTRATION.

The first national mine-safety demonstration,[1] a notable event of the year, was held at Forbes Field, in Pittsburgh, on October 30, 1911. The demonstration was planned and managed by the engineers of the bureau, with the aid of the miners and coal operators of the Pittsburgh district. It embraced exhibits that demonstrated the character of nearly every branch of the bureau's investigative work in relation to mine accidents, including first-aid and mine-rescue work, coal-dust explosions, and also special coal-dust explosions at the bureau's experimental mine at Bruceton, Pa. Approximately 15,000 persons, chiefly miners, mine owners, and mining engineers, attended the demonstration. The principal field exhibits were witnessed by the President of the United States and many officials of both the National and State Governments. Teams of miners trained in first-aid and rescue work from every coal-mining State were in attendance and took part in the demonstration. The value of such demonstrations has been fully proven by the manner in which this demonstration has stimulated the adoption of safety precautions in all the coal fields of the country.

FUEL INVESTIGATIONS.

The fuel-testing work of the bureau dealt with the more efficient purchase and use by the Government of fuels purchased and used in different parts of the country. Since the wording of appropriation acts limited the fuel investigations conducted by the Bureau of Mines to the analyzing and testing of fuels belonging to or for the use of the United States, the various technologic researches and the routine work relating to the examination of fuels under this bureau embodies two general lines of inquiry, as follows:

1. The inspection and analysis of coals, lignite, and other mineral fuels purchased under specifications for the use of the Government, to ascertain whether these fuels conform to the stipulations of the contract under which they are purchased; the development of a proper specification under which different coals may be purchased for different purposes and different equipment; and the ascertaining of the most efficient equipment and method of using these fuels.

2. The investigation of coals, lignite, and other mineral fuels belonging to the Government.

The work of inspecting and analyzing fuel purchases was largely extended and made more efficient during the year. The samples represented coal and fuel oil for use at Government power plants, public buildings, and naval stations in different parts of the United States and in the Panama Canal Zone.

The collection of the samples was done by or under instructions from the Bureau of Mines; and the analysis and testing of the samples formed an important part of the work of the bureau.

---

[1] Fully reported in Bulletin 44, Bureau of Mines, entitled "First National Mine-Safety Demonstration, Pittsburgh, Pa., October 30 and 31, 1911," by H. M. Wilson and A. H. Fay, with a chapter on "The Explosion at the Experimental Mine," by G. S. Rice, 1912. 75 pp., 7 pls.

The samples were collected wherever coal purchased under contract was being delivered to the Government. They represented deliveries made at public builings in the District of Columbia, or at public buildings, naval stations, and Army posts in many parts of the United States, and also the deliveries made at the great coal-shipping ports, as New York and Norfolk, where coal was being delivered for the use of the Navy, the Panama Railway Co., or the Isthmian Canal Commission.

In the fiscal year 1912 the purchase of coal by the Government under specifications providing for payment according to the quality of coal delivered amounted to approximately 1,500,000 tons, costing $4,750,000, notwithstanding the fact that the general plan was to apply the specification method of purchasing coal only to contracts of such size as warranted sampling, analysis, and heating-value tests. The tonnage sampled was 408,600 tons greater and its value was $1,666,000 greater than in 1911.

The specifications applying to the purchase of coal for use on the battleships and naval vessels named the mines from which coal was to be shipped under a given contract. The occasional analyses of samples showed whether the coal shipped equalled in quality, and if not how much it was below, the standard established in the contract. Coal purchased under specifications of this nature and used on naval vessels amounted in round numbers to 730,000 tons during the fiscal year 1912.

Most of the samples analyzed and tested for heating values at the Washington laboratory represented coal purchased under specifications that provided for payment according to the quality of the delivered coal. Analyses of mine samples were generally made in the bureau's laboratory at Pittsburgh. During the fiscal year ended June 30, 1912, 11,300 coal samples were received at the Washington laboratory, an increase of 3,000 over the number for the preceding year.

The analyses and tests of fuels at the experiment station in Pittsburgh are made to indicate the character of the coal and other mineral fuels belonging to the United States and to show how these fuels may be best utilized.

In analyzing samples of coal and lignite and other mineral fuels at the Pittsburgh station, the procedure followed was essentially the same as that of the Washington laboratory except that ultimate as well as proximate analyses were made at Pittsburgh. Continued effort was made to simplify and cheapen these methods in the interest of economy in the chemical work of the Government. During the fiscal year 1912 about 750 samples of coal and lignite, 200 samples of fuel oil, and 100 samples of natural gas were analyzed by the Pittsburgh station laboratory. The nature of the work, when carload samples of coal from Government lands are received, is as follows:

Combustion tests to determine the most efficient and least wasteful method of burning fuel in furnaces of the type used for heating the Government buildings, Army posts, naval stations, or Government ships in which it may be proposed to use such fuel.

The testing in the gas producer of another portion of the same shipment of coal from Government lands, in order to ascertain the suitability of the fuel for use in the producer and the conditions

requisite for obtaining the largest yield of high-grade gas suitable for power and heating purposes.

The testing of another portion of the same coal or lignite in a briquet machine with different binders in order to determine the feasibility of briquetting the coal or lignite and the making of steaming or gas-producing tests with these briquets to determine the conditions under which they can be utilized most advantageously, and demonstrations, on a commercial scale, of the possibility of producing briquets from American lignites without the use of a binder.

Investigations into the character of the various petroleums found throughout the United States, with a view to determining their calorific value, chemical composition, and the various methods whereby they may be made most economically available for efficient use as power producers for the Government, especially on board ships; and investigations of the heavier distillates of petroleum, as well as of kerosene and gasoline, in order to ascertain their commercial value and their relative efficiency in internal-combustion engines for use in naval vessels.

Investigative studies of combustion within boiler furnaces and gas producers to ascertain the temperatures at which complete combustion of the gases takes place, and the means whereby the waste of heat up the smokestack and the production of smoke may be lessened.

Related investigations concern methods of mining and of preparing coal for market and of boring for and transporting oil and natural gas to ascertain how present wastes in mining and transportation may be most economically and efficiently lessened.

During the year the bureau continued its researches, both chemical and physical, to determine the true composition and properties of the different varieties of coal and the chemical and physical processes of combustion, in order to determine how each coal could be burned most efficiently in a variety of Government heating and lighting plants. Experiments were conducted relating to the destructive distillation of fuels; the spontaneous combustion of coal, with especial reference to fire risks in storing coal on board ships, in closed bins, or on wooden wharfs; and the relative deterioration of coal during storage in open air, in closed bins, or under water. The results obtained in these tests are mentioned in the summarized discussion of the investigations in another part of this report.

* * * * * * *

NEED OF EXTENDING INVESTIGATIONS TO THE METAL-MINING INDUSTRIES OF THE WESTERN STATES.

Inasmuch as the appropriations for the Bureau of Mines during the past year were not sufficient to permit any extension of the work beyond the investigations relating to the mining and utilization of coal it was not possible to extend these investigations to the metal-mining industries. Meanwhile, however, the ratio of accidents to the number of men employed has been larger in many metal mines of the country than it has been in many of the coal mines, and the average is nearly the same in the two. There is therefore serious

need for the extension of the mine-accident work into the metal-mining field.

Moreover, the loss of life in connection with metallurgical operations in different parts of the country deserves special consideration. The serious need of inquiries and investigations looking to the improvement of conditions at metallurgical plants has become more and more apparent as preliminary inquiries have been made.

Furthermore, during the past several years the development in the mining industries of the Western States has fallen far short of that in agriculture. In some of the States there has been a retreat rather than an advance in mining development. It is believed that thorough inquiries and investigations concerning metal-mining conditions in the Western States would do much toward improving the safety and health conditions and toward lessening the waste of resources, as well as toward the general advancing and upbuilding of these industries.

The extensive waste in the mining, treatment, and utilization of mineral resources essential to our national welfare gives to these investigations a national importance they would not otherwise possess. Furthermore, in these States the mineral resources, upon which the welfare of the arid regions especially must always so largely depend, are to such an extent in nontaxable Government lands that the fact serves as another basis for demands on the national Bureau of Mines for aid and cooperation.

* * * * * * *

MINING INVESTIGATIONS.

INVESTIGATION OF MINE DISASTERS.

As a result of the investigation of mine explosions and mine fires by the engineers under G. S. Rice, chief mining engineer, the following features have been noticed:

GAS EXPLOSIONS.

At a number of mines where disasters have occurred the operators had considered the mines nongaseous, and accordingly had not taken sufficient precautions to insure ventilation at the face. Usually the mines had ample fan capacity, but investigation showed that at the face there was insufficient current, largely because of leaky stoppings. In some mines too much reliance was placed on line brattices to conduct the air current to the face. In some mines rooms had been turned ahead of the last break-through, so that when a fall of roof had knocked down the brattice, or curtains, or the doors on the roadways had been carelessly left open for greater convenience in haulage, there was no circulation of air, with the result that gas had collected and been ignited by an open light or the flame from a shot of black powder or dynamite.

Several disasters were caused by the mine foremen allowing miners with naked lamps to enter districts containing gas, or by the fire boss endeavoring to "brush" or fan out a pocket of gas by using a coal or canvas sheet and thus throwing the inflammable gas upon an open light. In the majority of American mines there is very little

inflammable gas (methane chiefly) under ordinary conditions, but at a time of low barometer, or when there has been a large fall of roof, or through encountering a fault or crevice containing gas, dangerous conditions arise suddenly between the time when the mine is inspected in the early morning and when the miner enters the working place. Many such disasters have occurred in so-called "nongaseous mines" in which open lights were used. When a mine is considered gaseous safety lamps are generally used, and many other precautions are taken. The absence of gas for days or weeks lulls suspicion and causes relaxation of effort on the part of the foreman. The remedy would appear to be a greater extension of the use of safety lamps.

COAL-DUST EXPLOSIONS.

In practically all the bituminous-coal mines in which disastrous coal-dust explosions have occurred the engineers of the bureau have observed that no attention was paid to the accumulations of dry coal dust in the inner workings. In some mines near the shaft or on the main roads artificial watering had been done, which satisfied the casual visitor that the conditions were safe; but the inner workings contained vast amounts of inflammable coal dust, which, when ignited by a small explosion of gas or a blown-out shot, or other cause, had initiated an explosion that traversed not only these inner workings but also more or less of the outer roadways which had been more or less dampened by sprinkling.

Even where an explosion has been stopped before it reached the mouth of the mine the afterdamp gases have smothered the miners throughout a much larger area than that traversed by the explosion. None of the mines in which large dust explosions have occurred had prior to the disaster employed systematic humidifying with steam.

ACCIDENTS FROM IMPROPER HANDLING OR USE OF EXPLOSIVES.

In many mines examined by the mining engineers explosives were carelessly handled. In certain instances the operators supposed that they had admirable shot-firing and inspection systems, but examination at the face disclosed that there had been many blown-out shots. In some cases it was found that detonators and explosives had been kept in the same box, and that shot firers had carried detonators in the same sack with the explosives. Where firing had been done with a battery it was found that many batteries were of the ordinary dry-cell type without any safeguards. In one accident during the year the State mine inspector reported that a shot firer was killed by putting a dry-cell battery in the same sack with detonators and explosives.

The use of permissible explosives that passed the tests of this bureau has much decreased the dangers of igniting gas and dust, but it has been found that they have not been used in some mines according to the methods prescribed by the bureau; that is, they have not been properly tamped or the charge limit has been exceeded.

In many cases the miner has been permitted to have too large a quantity of explosives in his possession. In some States he is permitted to have 25 pounds or more of black powder.

The method of bringing explosives into the mine and the method of storing them is bad at many mines. Stringent regulations on this subject should be made by State authorities. In some districts kegs of powder or other explosives belonging to the miners are left exposed in their respective working places instead of being placed in tight boxes with locks.

ACCIDENTS FROM ELECTRICITY.

Several disasters have been attributed to electric arcs from grounds or short circuits, igniting coal dust or gas. Trolley haulage should not be permitted in entries in which there is one-half per cent or more of inflammable gas.

In a large number of mines using electrical machinery it has been found that the installation was very imperfect, particularly as regards insulation. The use of electricity in coal mines is constantly extending, and an increasing number of accidents has been attributed to its use; hence greater care should be exercised in insulation. It would be desirable if every coal-mining State had an electrical engineer on its inspection staff.

MINE LIGHTING AND ACCIDENTS.

In all but two of the mines in which large disastrous explosions have occurred during the past few years open lights have been used. In many of these mines there was more or less inflammable gas, generally not in noticeable quantities, but sufficient to produce dangerous conditions under certain circumstances. On the other hand, the mines that have been considered and acknowledged by the operators to be gaseous have generally been free from explosions, although one small disaster was attributed to the imperfect condition of a safety lamp. Safety lamps give a poorer light and are especially unsatisfactory for examination of the roof and floor, but their use tends to produce discipline and care in other directions. Where used, however, they must be inspected daily by some competent person. Portable electric lamps give much better light and are being adopted to some extent in the Pennsylvania anthracite field. Different types of electric lights for use by miners are now under investigation by the bureau at Pittsburgh. If the safety conditions are to be improved, it seems probable that the use of these electric lamps will be widely extended, and will much lessen the danger of explosions and mine fires that attends the use of open lights.

NEED OF BETTER VENTILATION AT THE WORKING FACE.

As already mentioned, there is great need for improvement in mine ventilation, especially at the face where the miner works. Mine foremen are sometimes too easily satisfied with sending down large volumes of air into the mine and disregard the fact that it does not reach the face in sufficient quantity to sweep away gases that may accumulate there, either the fire damp from the coal or poisonous gases from the powder used in bringing down the coal. Generally the fan equipment at coal mines is sufficient, but in many of these mines the underground system of ventilation in the more remote parts

of the mines is not as efficient as it should be. It is usually easy enough to have good air along the main entries and haulage roads and manways, where the men travel, but it is more difficult, though just as important, to have good air at the places where the men work during the day.

INVESTIGATION OF MINE FIRES.

Some disastrous mine fires have occurred during the past few years through gross carelessness in handling open lights, or from short circuits of electric currents due to improper insulation, or from underground power plants. These have been the causes of fires in certain metal mines investigated, as well as in coal mines. One bad fire, which occasioned loss of life, was caused by setting fire to oil used for lubrication. Such instances are due both to the use of open lights and to the arrangements for storing the oil or other inflammable material. There has been a great disregard of danger in the employment of wood for underground engine houses, pump rooms, and stables, which are especially liable to fires. But in some districts, following disastrous mine fires, as in Illinois and in the anthracite fields of Pennsylvania, many drastic improvements have been made. Similar precautions against mine fires should be taken and facilities for fighting such fires should be introduced in mines throughout the country, without awaiting the occurrence of additional mine disasters. A preliminary report on mine fires, by G. S. Rice, has been prepared for publication as a technical paper (No. 24), and another, by J. W. Paul, has been prepared for publication as a miners' circular (No. 10).

NEED OF BETTER ESCAPE ARRANGEMENTS.

Many of the mines in this country have inadequate facilities for escape in case of fire or explosion. These should always be in duplicate, and either escape way should provide adequate means of exit from the mine. Few mines have sufficient provision in the way of fire-fighting equipment in and about the exit ways. The State of Illinois has passed some excellent laws and regulations for fire fundamental regulations requiring such improvements.
fighting, but unfortunately very few of the mining States have even

NEED OF REFUGE CHAMBERS.

Most victims of explosion disasters have been overcome by afterdamp and not by violence or burning, but some miners have escaped from disasters by bratticing themselves off in inner workings. These facts show that had refuge chambers been provided many of the miners that were lost might have been saved. Chambers of simple type are easy to make, and the several engineers of the bureau advise that all mines provide them. Even if nothing more than several mine rooms or chambers of ordinary size in different parts of the mine were utilized, these could have tight-fitting doors in duplicate, a supply of drinking water in sealed bottles, a limited quantity of food in cans, a supply of first-aid equipment, a few fire extinguishers, and, if practicable, a protected telephone. Such rooms would prove useful under many conditions arising in the daily routine of mining

operations, and would prove a good investment even though no large disasters occurred. Rescue parties would naturally aim to reach these rescue chambers promptly before making a random search throughout the mine; and in time of trouble, when ordinary escape ways were blocked by poisonous gases or rock falls, men in the mines would endeavor to reach these safety chambers. Where the mines are not deep, special holes might be bored from the surface down into such chambers, through which holes fresh air might be forced when needed below and through which telephone lines could be run to the surface.

While thus calling attention to the advantages of such rescue chambers, the bureau has not urged their installation as equal in importance to precautionary measures looking to the prevention of mine disasters. But interest in them increases as it is realized that mine disasters may still occur notwithstanding all precautions, though, let it be hoped, at increasingly less frequent intervals.

FALLS OF ROOF AND COAL.

By far the largest annual loss of lives in mines is caused by falls of roof and coal; this is true of metal mines as well as coal mines. The underlying cause of this large loss, which in the calendar year 1910 was 1,310 lives, and in 1911, 1,321 lives, is being sought by the mining engineers of this bureau. Though the immediate cause is lack of sufficient timber, the mining system seems also at fault, in view of the much smaller loss of life per thousand employed in the mines of Europe. Closely connected with this question is the reckless use of explosives, which shatters the roof, and the lack of sufficient direct supervision of the working faces by the mine foremen. The use of less timber and fewer mine foremen but more powder in American coal mines as compared with those in European countries meets the American demand for cheaper coal, but at heavy cost in the loss of human life and waste of fuel resources.

These facts need not be considered as a basis of criticism of either the miner or the mine owner, but they indicate an urgent need for recasting the economic conditions under which the coal-mining industry is now being operated.

Meanwhile the Bureau of Mines is beginning a careful examination into the nature and means of preventing accidents from these and other miscellaneous causes.

* * * * * * *

MINE-SAFETY WORK AND INVESTIGATIONS.

The chief work of the section of engineers, foreman miners, and first-aid miners of the mining division, which is under the direction of J. W. Paul, was the investigation of the causes of mine explosions and mine fires and the training of miners in the use of the methods and equipment employed in mine rescue work and in giving first aid to those injured in mine accidents. This work was carried on from the several mine-safety cars and stations. In addition, tests of miners' safety lamps and of mine rescue breathing and resuscitation apparatus were made at the Pittsburgh station and in the field.

Mining centers in all of the large coal-producing States were visited, and demonstrations, lectures, and training were given. Systematic training itineraries were arranged, involving stops of one, two, and three weeks at each place; during each stop classes of miners were given full courses of instruction and training in the use of mine rescue breathing apparatus and in first-aid work.

During the year the field work was conducted under an organization embracing six sections, over each of which an engineer had supervision. These sections were as follows:

Eastern section, including the coal-mining districts of Pennsylvania, Ohio, and West Virginia, cars 1 and 6 and the Pittsburgh station, in charge of J. W. Paul, assisted by J. T. Ryan and G. H. Deike, with headquarters at Pittsburgh, Pa.

Southern section, including the mining districts in Kentucky, Tennessee, Georgia, and Alabama, car 7, Knoxville and Birmingham stations, in charge of J. W. Paul, with headquarters at Pittsburgh, Pa.

Central section, including the coal-mining districts of Illinois, Indiana, Iowa, and Missouri, car 3, Urbana and McAlester stations, in charge of R. Y. Williams, with headquarters at Urbana, Ill.

Southwestern section, including Kansas, Arkansas, and Oklahoma, McAlester station, in charge of C. S. Stevenson, with headquarters at Pittsburg, Kans.

Southern Rocky Mountain section, including the coal-mining districts of southern Wyoming, Utah, Colorado, and New Mexico, cars 2 and 4, in charge of J. C. Roberts, with headquarters at Denver, Colo.

Pacific section, including coal and metal mines in Washington, Idaho, Montana, and north Wyoming, car 5 and Seattle station, in charge of H. M. Wolflin, with headquarters at Billings, Mont.

* * * * * * *

WORK AT THE MINE-RESCUE STATIONS.

At the Pittsburgh station J. W. Paul, mining engineer, had supervision of the work of training miners in rescue and first-aid methods, and the supervision of the tests of safety lamps and breathing apparatus. In addition, he was engaged in the preparation of publications dealing with mine safety. J. T. Ryan, assistant mining engineer, had direct charge of the testing of safety lamps. He was also engaged in testing and repairing rescue apparatus, and for part of the year had general charge of training work at the Pittsburgh station. G. H. Deike and O. H. Reinholt, assistant mining engineers, and D. J. Price, foreman miner, assisted during parts of the year in making tests of lamps and other apparatus, and in preparing reports, statements, and estimates. W. D. Roberts, foreman miner, and C. O. Roberts, first-aid miner, gave mine-rescue and first-aid training, and repaired apparatus, lamp equipment, etc.

In addition to the foreman miners and first-aid miner located at Pittsburgh as named above, K. H. Chisholm, C. S. Stevenson, J. M. Anderson, A. R. Brown, William Burke, D. D. Davis, Jesse Henson, W. A. Raudenbush, A. A. Flynn, J. M. Webb, W. T. Burgess, E. B. Sutton, A. A. Sams, and A. G. Hamilton, foreman miners, and W. D. Scofield, G. W. Salisbury, W. J. German, Leonard Farnell, J. T. Rey-

nolds, T. C. Harvey, and G. T. Powell, first-aid miners, were in charge of, or engaged in the work of, the mine-safety cars and stations for various periods of time during the year.

John Ferrell, first-aid miner, was killed in line of duty January 19, 1912, while exploring an inclosed fire area at Cherry Valley mine, Pennsylvania.[1]

INVESTIGATIONS AT THE EXPERIMENTAL MINE.

The primary purpose of the experimental mine at Bruceton, Pa., near Pittsburgh, is to enable explosions of coal dust and gas to be made on a scale comparable with ordinary mine explosions, which is not possible in a surface gallery because of the latter not being strong enough to resist rupture. Further, a mine presents special conditions, such as the coal walls, the slate roof, and the irregular timbering, which can not well be duplicated in a gallery of wood, steel, or concrete. Hence, preventive means that are successful under the artificial conditions in a surface gallery are not necessarily successful in a mine. This inference is supported by the result of experiments that have been conducted in surface galleries in different countries.

The arrangements at the experimental mine at Bruceton make possible the duplication of any kind of explosion that may be experienced in a coal mine.

In this mine, moreover, other investigations relating to safety can be made, such as tests of gasoline locomotives, of mining or cutting machinery, of permissible and nonpermissible explosives, of electrical apparatus, and of ventilating methods.

During the early part of the fiscal year the entries were driven 740 feet from the outcrop, the total length of single entry being about 1,700 feet. The first large test of the explosibility of coal dust under natural mine conditions was made on October 24, 1911. The mine headings had been loaded with only 1 pound of coal dust per linear foot of entry, and only 2 pounds of black powder, a quantity much less than ordinarily used in mine blasting, was used in charging the blown-out shot that started the explosion, yet the explosion was so violent that it broke the concrete lining in places.

On October 30, 1911, a public test was made as part of the national mine-safety demonstration at Pittsburgh; over 1,200 mining men examined the mine prior to the explosion, and watched the demonstration. The flames issuing from the mine lit up the country around, and the noise was heard for a number of miles.[2]

Other tests were made during the winter, and on February 24, 1912, a very violent explosion was witnessed by a large assemblage of mine inspectors, operators, and miners. The enormous speed of over 2,000 feet per second was attained by the explosive wave, and pressures of over 100 pounds per square inch were recorded.

After the test of February 24 experiments were made with gasoline locomotives and explosives, supplementing the work at the Pitts-

[1] Mr. Ferrell was the second of the rescue miners employed in the Bureau of Mines to lose his life while wearing artificial breathing apparatus in a mine containing irrespirable mine gases. The first was Joseph E. Evans, who was overcome in the Pancoast coal mine, near Scranton, Pa., April 7, 1911, while endeavoring to rescue miners caught in the mine by the disastrous mine fire of that date.

[2] The details of this test are described in a chapter by G. S. Rice in Bulletin 44, Bureau of Mines, 1912.

burgh station. In May and June the foreman miners and first-aid miners who were unable to continue the mine rescue and first-aid training at the cars and stations because of lack of funds were sent to the experimental mine to drive the entries and to test explosives. On June 30 the main entry and the air course were in 978 and 980 feet, respectively, making a total of about 2,200 linear feet of single entry.

Plans for the fiscal year 1912–13 include work of further enlargement of the mine to make it more like a commercial mine and tests of preventive means for stopping or checking explosions.

The chief results of the explosion experiments for the past year are as follows:

(1) The mining public has been convinced that coal-dust explosions can be produced at will in a mine as well as in a gallery.

(2) Coal-dust explosions may be caused by relatively small quantities of long-flame explosives in an unsafe shot which expends its energy outside the hole.

(3) Violent coal-dust explosions may be produced in a comparatively short distance; that is, 600 or 700 feet. This is a matter of much importance since it indicates the necessity of trying to prevent explosions from starting rather than trying to check them after being started.

A detailed report of all the experiments of the first series has been prepared for publication in the near future.

The experimental mine has been under the general direction of George S. Rice, chief mining engineer; L. M. Jones, mining engineer, and H. C. Howarth, mine foreman, have been in immediate charge of the mine and the preparation for the experimental tests; J. K. Clement, physicist, and his assistant, W. L. Egy, assistant physicist, have been in charge of the instruments and the records therefrom.

INFLAMMABILITY OF COAL DUST.

The laboratory study of the comparative inflammability of coal dust from various parts of the United States and of the factors that affect the inflammability of the dust is being continued in the laboratory at Pittsburgh. These experiments supplement the results of the tests on a large scale made in the explosives galleries and at the experimental mine and are of much value in bringing out the relative importance of different conditions affecting dust explosions in coal mines.

At the Pittsburgh experiment station inflammability tests were made also for a number of other coals, including some foreign coals. In all, some 35 coals were tested, involving approximately 500 determinations. During the year the manuscript and illustrations of a bulletin on the inflammability of coal dusts were prepared and submitted for publication.

The laboratory investigations at Pittsburgh were in charge of J. C. W. Frazer, chemist, from July 1 to September 1, 1911, and of E. J. Hoffman, assistant chemist, from July to December 1, 1911.

In cooperation with the State of Illinois, for the period January 1 to June 30, 1912, investigations of the inflammability of dusts from Illinois coal mines were undertaken at Urbana.

The laboratory study of the inflammability of face samples of coal and of rib-dust and road-dust samples powdered to pass through a 200-mesh screen taken from the mines of two Illinois mining districts, 6 and 8, was completed. In these districts are 19 mines, from which over 100 samples of coal were tested.

A series of experiments was made to determine the effect of commercial common salt (sodium chloride) when powdered and mixed with coal dust upon the inflammability of the dust. Mixtures of Pittsburgh standard dust containing, respectively, 15, 30, and 45 per cent of salt were tested.

It is expected that from the study of the inflammability of the road-dust and rib-dust samples a comparison may be made as to the relative possibility of such dusts propagating a large explosion, and that through the investigation of the composite face samples from the 100 mines it will be possible to thrown light upon the different coals in the State of Illinois with respect to the relative inflammability of their dusts.

In connection with the investigation of the inflammability of the coals from the various districts in the State, it is proposed to study the effect of the addition of shale dust in reducing the inflammability of coal dust, the determination of the quantities of shale dust necessary to render the coal dust nonexplosive, and the effect of the presence of small percentages of gas (methane) upon the inflammability of coal dust.

The mining investigations show that Illinois coal dusts form explosive mixtures, that explosions are rare in the northern part of the State, where there is much shale dust in the mines, and frequent in the southern part of the State, where small quantities of methane are present in the mines.

The work of the bureau in these laboratory investigations is in charge of J. K. Clement, physicist. L. A. Scholl, jr., junior chemist, conducts at Urbana the laboratory inflammability tests that form a part of the cooperative work with the State of Illinois.

OCCURRENCE OF MINE GASES.

In cooperation with the State of Illinois, and in continuation of the study of the geologic conditions governing the occurrence of explosive gas in mines, an investigation of some conditions under which such gas occurs in coal mines in southern Illinois was undertaken. The area selected lies south of a line passing through Duquoin, Benton, and Eldorado. Field work was begun the first week in January, after conference with the State geological survey at Urbana. All the representative mines were visited, many of them a number of times, and more than 200 samples of return air were collected. These samples were analyzed in the laboratory at the Pittsburgh station. Special consideration was given to the influence of rock structure and other geologic conditions on the occurrence of gas, and most of the sampling was so conducted as to permit the comparison of the total volumes of inflammable gas coming from different sections of a mine as well as from the main return.

Sampling at different times gave opportunity for comparing variations in the quantity of gas evolved, notably after the mines were idle for several weeks during a suspension of mining. A series of

tests was made to determine the pressure of the gas in the solid coal in various mines and in several parts of the same mine by boring 10-foot holes into the coal and placing in each a pipe tightly tamped for 7 feet of its length. The pressure was determined at different times and under different conditions by a pressure gage on the pipe, and in some instances the volume of gas escaping was measured. A few samples of pure gas from these test holes were collected for analysis, and samples of some of the borings were sent to Pittsburgh at weekly intervals to be tested for the quantity of gas given off. Some of these samples were taken separately at depths of 4, 8, and 10 feet in boring the test holes.

Somewhat more than three months was devoted to the field work, and then the assembling of the data was begun. Considerable progress was made in calculating the area of coal exposed in parts of mines tested, and the preparation of a base map was commenced.

This investigation was conducted by N. H. Darton, geologist.

* * * * * * *

REPORT OF THE COMMISSIONER OF INDIAN AFFAIRS.

DEPARTMENT OF THE INTERIOR,
OFFICE COMMISSIONER OF INDIAN AFFAIRS,
Washington, September 12, 1912.

SIR: I have the honor to hand you the Eighty-first Annual Report of the Office of Indian Affairs.

A DECADE OF INDIAN AFFAIRS.

In 1902, 77,000 letters were received by the Indian Office, which to conduct its correspondence had 132 employees; in 1911, 209,000 letters were received and there were 227 employees; in other words, the volume of correspondence had increased almost threefold, whereas the number of employees had not increased twofold. Even these figures do not nearly represent the added responsibilities of the office, for in the last 10 years Indian Office affairs have taken on a magnitude, a breadth, and a detail which are significant of a real attempt to master the Indian problem by preparing the Indians to leave their status of wardship, at last to lose their anomalous character as a people set apart and to join their white neighbors in the body of American citizenship.

For the recent development of the Government's policy, legislation in the early years of the decade of the eighties, tardily extending to Indians protection of the criminal law, and in the late eighties, giving general authority in the Dawes Act for allotting tribal lands in severalty, prepared the way. But for 15 years after the general allotment act was passed its benefits fell far short of its promise, for the essential purpose of the statute was perverted, since under the act of February 28, 1891 (26 Stats., 794), Indians who had received allotments were able to take the line of least resistance by leasing their lands to white farmers and by continuing to live quite after their former fashion. Thus it happens that present policies are comparatively of recent development—the policies which center upon indi-

vidual Indians and individual Indian families, seeking to give each Indian the health and the knowledge of health which will enable him to associate and to compete with his fellow Americans, to place each Indian upon a piece of land of his own where he can by his own efforts support himself and his family, or to give him an equivalent opportunity in industry or trade, and to lead him to conserve and utilize his property as means to these ends rather than to have it as an unappreciated heritage, through the loss of which only moral and industrial debasement and eventually pauperism are to be derived.

Long before the United States inaugurated its plan for the reclamation of arid lands the Indian service had spent considerable sums for irrigation; but before 1906 appropriations of Congress for this purpose aggregated only $1,356,000 and the work was inharmoniously and wastefully conducted through Indian agents and superintendents, with occasional assistance from a trained engineer. In 1902, however, a chief engineer was appointed and irrigation for Indians began to assume definiteness and plan. In 1905 the appropriation was $390,000; in 1911 it had grown to $1,400,000. Since 1907 appropriations have totaled $6,220,000, of which $4,830,000 were made reimbursable to the United States by the Indians when the Indians have become self-supporting upon their lands. Of the appropriations made before 1906, only $75,000 were made reimbursable. In all, 230,000 acres of land have been placed under ditch and are either being irrigated or can be irrigated immediately upon the construction of inexpensive laterals. During the season for greatest activity there are now employed in this service 150 engineers, assistants, and field men, such as rodmen, chainmen, and the like. Of this force 27 employees are organized for techinal and administrative activities and 36 for operating and maintaining existing projects. Since 1906 all the more important projects except the systems at Crow Reservation, Mont., and Yakima Reservation, Wash., have been begun.

The timber interests of Indians on allotted and on tribal lands reach a present value of $84,000,000. Before 1906 there was no widespread protection against forest fires, nor were there plans for broad development and utilization of forest resources; operations were confined almost exclusively to Wisconsin and Minnesota, where timber was cut by contractors, in 1906 realizing $247,000. Indian agents and superintendents were in charge of the work, having technical assistance only from a superintendent of logging. Forest resources outside of Wisconsin and Minnesota were given little attention, although the timber on Indian reservations in Arizona is valued at $11,000,000, in Washington at $13,000,000, and in Oregon at $27,000,000.

A realization of the importance of Indians' property in forests led in 1908 to a cooperative agreement whereby the Forest Service undertook to manage and administer Indian forests. About 15 months later the agreement was terminated for the reason that divided responsibility in administration and in results did not prove satisfactory. At once the Indian Office set about creating an administration organization which would comprehensively administer Indians' property in timber throughout the country. There are now 144 men engaged with forestry affairs in positions from forester to forest guards. In 1911 sales of timber brought in for Indians $2,192,000.

Petroleum is a natural resource belonging to the Indians which has been developed almost entirely since 1902. In 1902 the Census Bureau, in a special report upon the production of petroleum, dismissed Indian Territory, occupied by the Five Civilized Tribes, with a minute footnote recording the existence of 13 wells; concerning Oklahoma, the report said there were many natural petroleum seeps, but nothing in the way of actual petroleum production. In that year, however, wells within the present boundaries of Oklahoma produced 37,000 barrels of oil. On July 31, 1902, the Secretary of the Interior made the first oil and gas lease of Indian lands within this area. Under the Curtis Act of 1898 the Secretary had received authority over these lands which had previously been exercised, if at all, by the Five Civilized Tribes themselves. From 1903 the development of oil was phenomenal. To date over 22,000 leases have been made of lands restricted in alienation. Under these leases 133,245,000 barrels of oil have been produced and $6,344,000 in royalties have been paid to the Indians. Furthermore, since 1908 royalties paid upon oil and gas leases on lands of the Osage Indians have aggregated $1,900,000. From inconsequential beginnings 10 years ago Oklahoma has now come to rank second among oil-producing States, in 1911 yielding almost one-fifth of all petroleum produced in the United States.

For allotment of lands in severalty outside the boundaries of Indian Territory Congress has appropriated $4,900,000, of which it appropriated almost $2,000,000 since 1906. Of the 104,000 Indians who have been given allotments through these appropriations almost one-fourth, 24,408, have received their allotments within the past five years. The present efficiency of the organization used in making allotments appears not only in the gross amount of work it has accomplished, but also in its economies; for instance, in 1910 new arrangements for surveying were made with the General Land Office under which much delay is avoided, and the average cost per allotment has been reduced from $42 to $28. At the same time new methods of keeping records of allotments in the Indian Office were introduced, avoiding both the cost and the chance of error incident to copying elaborate schedules, and giving within one cover the original schedule, the original plats, and the original classification of surplus lands. Economies in making allotments are particularly desirable, since the appropriations are reimbursable from funds of the Indians.

Allotment of the Five Civilized Tribes under the act of 1898, conducted by the Commission to the Five Civilized Tribes and later by the Commissioner to the Five Civilized Tribes, was the largest task of its kind ever undertaken, resulting in allotment of lands in severalty to upward of 90,000 persons. Through a succession of events these individualized holdings in land and the individual affairs of the allottees have come under the Union Agency of the Indian Office. Even after extensive removals of restrictions on alienation and the like, administration of affairs of members of the Five Civilized Tribes whose lands are still restricted from alienation reaches great proportions.

Almost necessarily allotment proceeded by rule of thumb; furthermore, designation of lands in severalty was not accompanied on any

broad scale with equipment in training or in improvements and implements. As a consequence, in many parts of the country Indians were land poor, often possessing fertile lands but having no means to utilize them. To furnish individual Indians with an opportunity to secure inclination and training and a provision of working capital has been the great task of the past 10 years. A vast deal remains to be done, but something has been accomplished.

Legislation was necessary as a basis for progress in this direction. An act of 1902 permitted the Indians to sell allotments which they had inherited; an act of 1906 gave the Secretary of the Interior authority to issue patents in fee to allottees of whose competency to manage their own affairs he was satisfied; and an act of 1910 in addition to strengthening the earlier statutes enabled allottees to devise their lands. Somewhat similar legislation has affected allottees in the Five Civilized Tribes.

Under the legislation affecting allottees outside the Five Civilized Tribes there have been sold 874,446 acres of inherited land for $13,411,000, and 215,186 acres of land held by incompetent Indians for $3,394,000; 6,167 patents in fee have been issued for a total of 638,870 acres. Thus, out of an allotted area of 17,000,000 acres 1,728,000 acres have been alienated or made alienable through this office and the department. Furthermore, in the Five Civilized Tribes, where 15,700,000 acres were allotted, 8,000,000 acres were made alienable by the act of May 27, 1908. In districts where Indian lands are desirable, the results of allotment accompanied by policies of leasing and of sale are illustrated by the situation at Winnebago, Nebr.: Forty-eight per cent of the allotted lands are under lease, 13 per cent are being farmed by Indians, and 39 per cent have been sold.

As has been indicated, the purpose of the legislation permitting sales and authorizing the issue of patents in fee was to enable Indians to change holdings in land which they would not need as land into another form of property which they could utilize to improve and cultivate land which they kept, or which they could have as capital in occupations other than farming. These purposes were not attained in any reasonable degree when the first sales of inherited lands were made, for the reason that the proceeds were placed directly in the hands of the Indian heirs, usually persons who for the first time had in their possession considerable sums of money. As was to be expected, they very shortly were precisely in the economic condition they had occupied before their lands were sold, and if anything were worse off through the debauchery which attended the loss of their money. To remedy this situation of affairs the Secretary in 1904 required as a condition precedent to his approval of petitions for sale an agreement that the proceeds should be administered for the benefit of the Indians, with a stipulation that each Indian creditor might receive a monthly allowance of $10 in cash. To this supervision persons who find advantage in dealing with Indians made much objection, and have never ceased their antagonism. The principle adopted by the Secretary has, however, been maintained, although the incidental provision for a monthly allowance, which most Indians used as an excuse for a miserable life of indolence, was abrogated in 1909, and all disbursements of these funds were made questions of the condition and necessities of the individual Indians.

In the first two years of the operation of the act permitting the sale of inherited lands the proceeds of sales amounted to $3,450,000. Then provision was made for supervision of these funds, but superintendents made deposits in Government depositories without security other than the security extended to individual depositors. Since 1905 depositories of these funds have been required to give bond for the protection of the full amount of these deposits. In 1911 deposits of individual Indians' money in banks earned $272,948 in interest for the Indians.

Together with other moneys accruing to individual Indians rather than tribes, such as rentals for allotments, proceeds of timber sold from allotments, and royalties from oil and gas produced on allotments, these funds are designated as individual Indian moneys. Notwithstanding the fact that a large area of allotments has been patented in fee simple and thus proceeds from their sale and lease go directly to individual owners, the amount of individual Indian moneys on deposit in banks has steadily increased; but the deposits have increased in the face of increased liberality of disbursement where Indians have sources from which their funds can be replenished, and it is not necessary to husband scanty deposits of old and disabled Indians that they may be kept from want. On July 1, 1908, $3,992,300 had accumulated; during the following 12 months $8,991,300 were received; during the year $6,468,000 were disbursed. On July 1, 1909, there was a balance on hand of $6,622,600; receipts during the following year were $10,584,600; $7,656,900 were disbursed. On July 1, 1910, there was a balance on hand of $9,550,400; during the year $7,881,800 were received; disbursements were $6,696,500. On July 1, 1911, $10,735,700 were on hand. Thus, in 1910 receipts increased by over 16 per cent; disbursements, however, increased by over 18 per cent. In 1911 receipts decreased by 26 per cent, but disbursements decreased by only 12 per cent. Furthermore, an analysis of disbursements indicates the policies under which these funds have been administered; the amount annually placed directly in the hands of Indians, as means of developing responsibility, has remained rather constant at about $2,300,000; but the amounts checked out of depositories by Indians, with the approval of the Indian Office, for use in beneficial ways, were $2,103,600 in 1909, $2,543,500 in 1910, and $4,339,200 in 1911; in other words, in 1910 there was an increase of 20 per cent over 1909, and in 1911 an increase of 70 per cent over 1910. If one remembers that these funds represent the only ready assets of many of the Indians—the only financial means they have of improving their condition—and that the owners are as yet either, in fact, incompetent for complete control of their property or have of their own accord remained in the class of incompetents by failing to apply for patents in fee or certificates of competency, it is difficult to avoid a conclusion that much greater liberality has been used in managing this part of the Indians' estate than would be permitted to a guardian of white citizens who were in similar circumstances.

Of the $20,821,400 individual Indian moneys disbursed between July 1, 1908, and June 30, 1911, the Indians have undoubtedly expended a part in unwise ways, but they have also used considerable sums to purchase good grades of work horses, implements, and equip-

ment, and to erect modern houses and barns. For example, during the last four months of the fiscal year 1911 members of the Five Civilized Tribes in Oklahoma erected 88 houses and 22 barns, using almost entirely their individual Indian moneys.

In the administration of Indian affairs no reform more intimately affecting the welfare of Indians has been made than the change in the administration of individual Indian money enforced, after abundant notice to the public, under the Secretary's order of December 17, 1909; this order provided that thereafter no assistance should be given to creditors in collecting from Indian debtors. Before the time of this order, in the face of a regulation promulgated as early as 1880 Indian traders and other creditors had in effect presented their bills to the superintendents in charge of reservations.

In order that there might be no chance for a complaint against the Government, based on past practices, provision was made not only that thereafter all persons extending credit to Indians should do so entirely at their own risk, but also that all debts contracted by Indians before December 17, 1909, and unpaid, should be scheduled, scrutinized, and made stated accounts, so far as they were found just. Accordingly, there have been scheduled in the Indian Office on behalf of 2,586 creditors claims aggregating $1,706,000. So far lack of clerical assistance has prevented the office from proceeding further than making the schedules. So soon as Congress responds to the request for further clerical assistance, the claims will be reduced to stated accounts. The necessity for investigating the claims now scheduled before they are reduced to stated accounts is apparent from experiences the office has had in the past: in 1906, upon investigation of traders' claims at Winnebago, Nebr., aggregating $30,000, it was ascertained that not more than 50 per cent of the amounts claimed represented consideration received by the Indians.

Training of Indian children and of Indian adults for lives of self-sufficiency and of usefulness—for inclination and for knowledge how to make their individual possessions in lands and in money beneficial to them—has since 1902 steadily increased in effectiveness.

In 1901 the appropriation for schools for the first time exceeded $3,000,000, in 1908 reaching a maximum of $4,105,715, and amounting to $3,757,000 in 1912; in the 12 years, 1901–1912, inclusive, the appropriation for Indian schools aggregated $44,200,000.

In 1901 the average attendance at Indian schools was 24,077; in 1908 it reached 25,964, and in 1911 it had fallen to 23,647. These figures become significant when considered in connection with the statistics for attendance of Indian children in public schools; for in 1902 the average attendance at public schools was 98; in 1911 it was 10,625.[1] From these data is follows that thousands of Indian children, who 10 years ago would have attended Government schools, now have such standards of personal cleanliness and come from such homes that they attend public school in company with their white neighbors; and it also follows that the average attendance for Government schools in 1911 contained a proportionately larger number of Indian children whose exclusion as yet from public schools, either because their homes are at a distance or because of personal habits,

[1] It should be said, however, that the figures for 1902 refer only to Indian children in public schools under Government contract; those for 1911 give the attendance in public schools throughout the country.

is the only justification for the maintenance of separate Government schools. In the last two years the devotion of Government schools to their proper province has been further secured by the elimination of many children who in reality are ineligible for education at Government expense.

The attendance of Indian children at schools of all kinds—Government, mission, and public—has increased from 24,120 in 1902 to 39,397 in 1911. The fact that in 1911, 24,000 Indian children of school age were not in any school indicates at once the educational task which remains and the extent in which the task was not met in 1902.

Not only have Indian schools been made to reach more effectively the Indian children who stand in most need of them, but during this 10-year period there have been incessant efforts to make more effective the training given each Indian child to the end that in the most direct way Indian schools may coordinate with the vital policy of making Indians normal members in the citizenship of their communities. All possible insistence has been put upon industrial training; in academic subjects Indian schools have adopted the courses of study of their States that they may correlate with local public schools; to the same end emphasis has been placed upon the development of local day and boarding schools rather than upon distant nonreservation schools; and in 1910 the Indian schools were grouped into six districts, each under a supervisor, who has the duty of visiting and keeping in constant touch with the schools in his jurisdiction, that each school may be kept at its highest efficiency and its greatest usefulness to the Indians it is meant to serve.

The process of eliminating Indian schools in localities where they are no longer needed for their peculiar purposes appears in acts of Congress under which, in 1911, the governor of Utah accepted for his State the grant of the Ouray School, and the governor of Colorado for his State accepted grants of the Fort Lewis and Grand Junction Schools.

Earnest efforts have been made, too, in industrial education of adult Indians. In cooperation with the Department of Agriculture an important farm for the development of new crops for the Southwest has been maintained at Sacaton, Ariz., since 1908, and successful cooperative experiments have been tried elsewhere. Furthermore, several demonstration farms have been maintained by employees in the Indian Service as examples for neighboring Indians. In 1910 examinations were held by the Civil Service Commission for expert farmers, men qualified both in modern technical training and in practical experience. At the end of 1911 48 such men had been added to the service and were at work among Indian farmers. At the end of 1911 superintendents in charge of reservations reported that out of a group of 28,544 able-bodied male adult Indians, 24,489 were farming for themselves, and out of a group of 65,636 able-bodied adults, 20,178 were engaged in stock raising as their principal means of support.

In 1907, however, it was realized that education and industrial incentive did not affect the modes of life of the more backward Indians with sufficient rapidity to protect them from diseases which arise from insanitary surroundings. For years physicians had been employed, drugs furnished, and some local hospitals maintained, but

there was a lack of appreciation of the great need of preventive medical measures directed by experts. After an investigation, which disclosed prevalence of tuberculosis and of trachoma, appeals were made to Congress, which for 1910 made a special appropriation of $12,000, for 1911 a special appropriation of $40,000, for 1912 a special appropriation of $60,000, and for 1913 a special appropriation of $90,000. These special appropriations enabled the office to establish five sanatoria; to send ophthalmologists to centers of trachoma prevalence to supervise and direct the staff of resident medical employees which in 1911 had grown to 100 physicians employed in established positions, 60 contract physicians, 54 nurses, and 88 field matrons; and finally to conduct a campaign for education of Indians, both young and old, in the elements of sanitation and of healthful habits. In 1905 the whole cost of the medical service of this office—salaries of physicians and the like and cost of medical supplies—as paid from appropriations available, was $120,000; in 1909 it was $166,000; in 1911 it was about $260,000. This increase in six years of more than 110 per cent in expenditures on behalf of the Indians' physical well-being has been accompanied by an even greater effectiveness of expenditures. Ten years ago there was not only indifference to questions of health but payments of salaries to physicians were unaccompanied by provision of such equipment that the physician could travel the great extent of territory to which he was assigned and among as many as 5,000 Indians perform with his own hands the whole gamut of major and minor operations and treat every ailment known to medicine. In a measure the increased expenditure of recent years represents the cost of transmuting into direct efficiency the potential usefulness of positions which already existed.

Intoxicants are almost as great a menace to Indians as disease. Recognizing the great harmfulness of intoxicating liquors for Indians, Congress has for more than 100 years maintained a fixed and unchanging policy of absolute prohibition upon traffic with Indians in intoxicating liquors. The act of March 30, 1802 (2 Stat. L., 246), conferred on the President authority to prevent or restrain introduction or distribution of spirituous liquors among Indian tribes; in 1815 Congress prohibited stills in Indian country; and in 1832 Congress provided "no ardent spirits shall be hereafter introduced, under any pretense, into the Indian country." Until 1906, however, enforcement of these statutes and subsequent enactments was left to Indian agents and superintendents and their Indian police, assisted so far as might be by local peace officers and by representatives of the Department of Justice. In 1906 criminal dockets in Indian Territory became so crowded and the possibility of early trial so remote that disregard of the statutes forbidding introduction of intoxicants assumed large importance. To meet the emergency Congress, in the act of June 21, 1906, appropriated $25,000 to be used to suppress the traffic in intoxicating liquors among Indians, and in August, 1906, a special officer was commissioned and sent to Oklahoma, that he and his subordinates might, through detective operations, supplement the efforts of superintendents in charge of reservations. In the fiscal year 1909, when the appropriation had grown to $40,000, this service began to operate throughout all States where Indians needed protection. In 1911 the service had grown until it had an appropriation of $70,000 and an organization including 1 chief special officer, 1

assistant chief, 2 constables, 12 special officers, and 143 local deputies stationed in 21 States. The increasing success of the service appears in the fact that in 1909 561 cases which the service secured came to issue in court, resulting in 548 convictions, whereas in 1911 1,202 cases came to issue, 1,168 defendants were convicted, and but 34 defendants were acquitted by juries. In 1911 fines imposed amounted to $80,463, or more than the appropriation for the service.

The activities which I have outlined as incident to the attack at every point upon the "Indian problem" would have been impossible without changes in business methods within the Indian Office itself. In 1907 and 1908 the office was completely reorganized, the most modern methods of filing were installed, new systems of bookkeeping were instituted, and in every part of the routine economies were enforced. As a result the heavy and intricate correspondence of the office, in spite of its increase by threefold within 10 years, is handled with a directness and a dispatch which were unknown before. Simplication of office methods has enabled clerks to devote less time to mere routine and a great deal more time to the significance of the subjects with which they deal. Accordingly the employees of the office are not only more efficient, but as a body they show genuine interest in the part they have in considering problems of administration. From reorganization the intangible but none the less perceptible gains quite equal the statistical increase in the amount of work each clerk performs.

PRESENT DEFECTS.

The burden of any statement of Indian affairs during the last 10 years is individualization. As yet, however, individualization has progressed rapidly only in tenure of lands. As tribes Indians have in the Treasury of the United States $41,800,000, interest on which in the sum of $1,900,000 accrued in 1911. Part of this interest was distributed in per capita payments to members of the tribes—a system of petty doles which is the most considerable surviving portion of the policies of 30 and 40 years ago, and those policies helplessly and frankly contemplated dependence and pauperism. In 1911 per capita payments amounted to a total of $3,700,000; of this sum $333,000 was distributed in shares which were less than $12.

The act of 1907 took the first step applicable generally to all tribes having common funds, giving the Secretary of the Interior discretion, after a member of the tribe applied for his share and was found capable to manage his own affairs, to apportion to him his individual share, which thereupon becomes subject to the Indian's order; the act also gave authority to pay the pro rata shares of disabled Indians. Under this act $1,296,000 of the principal of trust funds have been paid to June 30, 1912.

It will be noticed that there is now no authority of law for segregation of shares of Indians who belong neither to the class of competent Indians nor to the class of disabled Indians. There is a defect in the present statutory authority in that it does not permit the pro rata share of each Indian of every degree of competency to be placed to his individual credit, to be paid to him or husbanded according to his individual development and his individual necessities, and at his death permitted to pass to his next of kin according to the laws of

his State. At present a bill submitted by the department intended to confer authority for such disbursement of tribal funds is pending in the Congress, having been reported favorably to the House of Representatives. Of all legislation on behalf of Indians proposed in recent years the enactment of such a statute would mean most for the industrial development of Indians and for their economic independence.

Preliminary to segregation of trust funds the remaining annuities and similar provisions which survive from old treaties should be commuted and capitalized. As a further preliminary all Indian tribes that have claims against the United States should receive legislative authority, under a general statute, to have their claims adjudicated by the Court of Claims. In this way claims of Indians can once for all be adjudicated, those which are just ascertained and prepared for consideration of the Congress, and an element of discontent among Indians and of expectation which may often be unfounded will be permanently removed.

If such legislative authority as I have mentioned is given, tribal affairs will become of small consequence, Indian administration will no longer concern a race but will affect only individuals, and the legislative scheme under which the United States may prepare for withdrawing from its position in Indian affairs will be fairly complete. The statutes are so numerous, however, that there is great need of careful codification, accompanied by some amendment. As the public land laws permit citizens under certain conditions to select second homesteads, Indians who have never received allotments and Indians who have parted with their allotments should be allowed to enter homesteads on agricultural lands within national forests; the statute permitting the devise of allotments should be broadened to allow devise and bequest of all forms of trust property, personal as well as real, and its benefits should be extended to Indians in Oklahoma outside of the Five Civilized Tribes and the Osage Nation, which already have adequate power to dispose of trust property by will; authority should be granted to permit, under regulations, mining upon Indian reservations set aside by Executive order; and there should be a modern definition of Indian country, or the idea expressed in the term should have a restatement which will accord with present conditions. Some laws affecting particular reservations require amendment, as the provision under which the Flathead Indians would have to reimburse the United States for the whole cost of a $5,000,000 reclamation project, whereas white citizens would receive fully one-half of the benefit; and the exception of timber in the States of Wisconsin and Minnesota from the authority to sell mature living and dead-and-down timber should be annulled.

Any codification of statutes affecting Indians should be annotated to the decisions of the courts and supplemented with a digest of the multitudinous decisions of both State and Federal courts.

In a codification of Federal statutes affecting Indians care should be exercised against the danger of extending present Federal law, for the body of law affecting Indians as a class should be kept within as small compass as possible, and should relate only to subjects about which the necessity of special legislation is imperative. With all the expedition compatible with the Indians' welfare they should be made subject to the laws of their States and be taught to look to their

local government instead of the National Government. Because of my conviction that no possible obstacle should be placed in the way of the transformation of Indian affairs administered by the United States into the affairs of normal citizens under the ordinary jurisdiction of the States, I do not suggest that further authority be given for enlarged Federal jurisdiction over minor offenses on reservations, although under existing law it is frequently very difficult to define the power of the office or of its representatives. Important questions of marriage and divorce illustrate difficult points, of which the only proper solution appears to be education of Indians, whether or not they are citizens, to comply with the laws of their States.

Administratively the most serious difficulty which confronts the Indian Office lies in the lack of supervisors or examiners who can go from reservation to reservation and inquire into the superintendents' management of the Indians' business which is in their hands; measured as business, the affairs in the hands of superintendents involve many millions of dollars. For schools the office has a corps of supervisors who in two years have greatly increased the efficiency of educational activities and expenditures; but it is neither possible nor desirable that these men, necessarily men who are essentially "school men," should also attempt to scrutinize adequately the business relations of superintendents with the Indians in their jurisdictions and the success of superintendents and their employees in assisting Indians toward a wise use of their allotments and money in industrial development. Repeated experiences have demonstrated that superintendents can practice irregularities which a distant office force can not detect, and can so color reports of industrial conditions that the office is for a time misled. Both experience and the dictates of sound administration require frequent examination of agency affairs by a representative of the office who is not personally interested in the management of the agency or in the affairs of the surrounding community. The Commissioner of Indian Affairs and the assistant commissioners annually spend in the field such time as the exigencies of public business and of congressional demands permit, but they can not make detailed examinations at upward of 60 agencies.

If agency affairs are placed under a responsible supervision, administrative economies can at once be installed; for example, leases of allotments for agricultural purposes can be made directly by the superintendent, instead of through the office and the department; thus a vast deal of routine labor would be saved on the reservations and in Washington. If superintendents' actions were subject to frequent examination on the ground, superintendents could be required to make most of the allotments, displacing the special allotting agents and enabling the office each year to save considerable sums of money. Furthermore, it would be possible to examine closely into the necessity and value of the positions now maintained at agencies. There can be little doubt that very considerable economy and greatly increased efficiency could be secured by reducing the number of positions in the field and paying increased salaries in return for more valuable services in the remaining places; but no reduction is possible without great and possibly irreparable harm unless the situation at each agency is considered very critically. Examiners making accurate reports to the office could also furnish such concrete data

that it might be possible to obtain from Congress appropriations for repair of buildings which would make some adequate provision against depreciation. Depreciation now progresses from year to year, to the ultimate cost of the United States. And, finally, under competent supervision the business of agencies could be so systematized that effort now spent in unprofitable routine could be turned to such needed activities as the determination of heirs entitled to the estates of deceased Indians. No better example could be set for Indians than through clear-cut and prompt action upon each piece of business they bring to the attention of the superintendent in charge.

In the purchase of supplies this office annually spends over $3,000,000. A large part of the purchases are made through five warehouses. The needs of the service, however, require no more than two, or at the most three, warehouses.

Partly because of inadequate supervision of superintendents and their relations with Indian allottees and through lack of timely information in Washington, water rights essential for the use of allotted lands on several of the reservations are in jeopardy, although extensive works for irrigation have been constructed. There is danger that while the United States keeps in trust the legal title to allotments, title to water, without which the land is of small value, will have been alienated under State laws based upon beneficial use.

Several administrative changes are necessary that there may be unity of responsibility. For example, the head of the Irrigation Service is a direct subordinate of the Secretary, whereas his staff are subordinate to the Commissioner of Indian Affairs. In the management of affairs in the Five Civilized Tribes there is a somewhat similar condition. The Commissioner to the Five Civilized Tribes, who has in his hands tribal concerns, reports directly to the Secretary; the officer in charge of individual interests for the same Indians reports to the Commissioner of Indian Affairs. The necessity of separate administration of tribal and individual affairs has passed; the duplication incident to the present arrangement, with its heavy expenditure for salaries and office expenses, should come to an end.

And, finally, the force of clerks in the Indian Office should be increased. The present staff labors under a burden of business which at times is almost intolerable. Clerks drawing salaries of $1,600 and $1,800 a year can not get sufficient stenographic assistants; the work of reducing traders' claims to stated accounts can not go forward; the task of determining heirs entitled to the estates of deceased Indians, and in this way preparing for the sale of inherited lands, can not progress in any satisfactory way; and even the examination of disbursing officers' accounts and the posting of expenditures under a thousand or more heads, as required by the form of appropriation, falls into arrears.

The energy put into the administration of Indian affairs for 10 years has had results, but there has to be still more tightening of the tension. Educational opportunities must be taken to thousands of Indian children who are not yet in school; industrial impulse and opportunity must be given to Indians who do not now value their possessions or who have no way to turn their properties to beneficial

account; zealous and effective protection of Indians in their property and personal rights has to be secured; medical attention and instruction in the laws of health must be given broadcast throughout the Indian country; a chance has to be extended to thousands of Indian families for living in sanitary homes. Only in these ways can the day of the Indians' emancipation from national guardianship and of economic, social, and political independence be sped, and the obligation that is upon us of affording the Indians the same opportunities, rights, and privileges as other Americans be discharged.

HEALTH.

The campaign for good health and physical efficiency among the Indians has continued with increased momentum along the lines outlined in my annual report of last year.

With the small force and inadequate funds at our disposal we have endeavored to meet exigencies as they arose; have attempted to stem the tide of disease, and in addition have been gathering such data as would enable us to impress the Congress with the need of money enough to make a complete medical survey of the whole field, and to increase and organize a medical corps for a house-to-house campaign against disease throughout the service.

* * * * * * *

According to the most reliable statistics obtainable, the death rate among Indians is 160 per cent of that among all other classes in the registration area of the United States, and the mortality from tuberculosis is three and one-half times as great. For the fiscal year 1913 the total funds available to meet these conditions are approximately $334,000.

Stereopticon lectures, both to the school children and to the adult Indians on the reservation, have proved a most effective way of combating disease. Seeing has been found to be believing, and believing has been responded to by action. Such lectures have been given at substantially every school and reservation in Arizona, New Mexico, Oklahoma, Michigan, Wisconsin, and Minnesota. Not a single one of the 22 States where the Government owes this campaign to the Indians should remain uncovered during the coming year.

Approximately 20,000 Indian children competed for prizes in special tuberculosis study and composition work thereon. All pupils above the second grade were required to take part. The manual of tuberculosis published by the office was used as a basis for the facts taught. Five hundred and sixty-one prizes were awarded—gold, silver, and bronze buttons. The office wrote a personal letter to each child receiving a prize; and some letters received from the children, written apparently at their own initiative, have shown the deeply practical hold this contest has obtained in their lives. One of the most significant showings in these letters is the children's spontaneous statements of the interest developed in their parents in good health through this contest. Thus, we have another proof of the influence of education through children upon parents.

The three tuberculosis sanatorium schools have been distinctly improved during the year. That at Fort Lapwai has been almost completely overhauled and rehabilitated. This school began with a small experimental tuberculosis school for the Nez Percé pupils, and has gradually grown to a modern, well-equipped sanatorium with a capacity of 100, receiving patients from many reservations of the Northwest. It is now under the independent management of a physician superintendent. The Phoenix sanatorium has been enlarged and is becoming a real factor in the fight on behalf of incipient tubercular pupils in the Southwest. At Laguna a high-altitude sanatorium is being developed to meet cases requiring treatment in high altitudes. These three sanatoria have shown that the belief that Indians could not be successfully treated in sanatoria is a fallacy. During the last year there were at these three sanatoria 5 deaths and 116 cases of distinct improvement and 14 cures. In the light of these results the office believes that there should be at least one well-equipped sanatorium in each area of the Indian country marked off from others by distinctive climatic conditions. Thus, all incipient and advanced patients of a reservation who are suffering from tuberculosis should have this help for themselves, and their community should have this protection.

A corps of ophthalmologists is being built up against trachoma. The work of these men is primarily the instruction of the local agency and school physicians in the practical methods of operation and treatment. Under the direct supervision of these teaching physicians more than 3,000 cases have been operated upon this year, and more than 8,000 cases have been treated by the regular agency and school physicians. A pamphlet on the treatment of trachoma, written by two service ophthalmologists, has been distributed to all physicians, in addition to other publications on the diseases of the eye.

Epidemics of measles have occurred at Jicarilla, Tulalip, Cheyenne River, and several other schools, but no deaths have followed. Isolated cases of smallpox have appeared among Indians at Quinaielt, Wash., and among white persons living near Indian communities at various places. None of these latter cases resulted in infection among the Indians. The general vaccination order issued last year has been strictly enforced. Five cases of epidemic cerebrospinal meningitis, resulting in two deaths, occurred at Fort Sill, Okla., and two cases, with one death, at Collins Institute, Okla. At both places the disease was promptly diagnosed and careful precautions taken against its spread. Flexner's serum was promptly used. The three deaths were from an exceedingly virulent and fulminating type. At the time of these occurrences the disease was epidemic among the whites in Oklahoma and Texas.

Recently systematic cooperation with State boards of health began. Every superintendent throughout the service has been instructed to cooperate heartily, and the State boards have as heartily responded. One of the first steps which will be taken, if Congress grants the necessary money, will be to appoint traveling dentists for all of the schools, or to make contracts with local dentists where practicable. A strenuous campaign should be made among the teeth of the Indians. Every child ought also, in my judgment, to be examined for adenoids.

Physicians in the Indian Service should be graded as they are in other branches of the Government service and, in the hope of money enough from the Congress to employ them, the entrance requirements in the civil-service examinations should be raised, so that better new men for the service can be secured. Liberal provision should be made for annual and educational leave for these men, as that is essential to their practice and growth as physicians. This is peculiarly true, due to the isolation of physicians on many Indian reservations. Series of well-illustrated pamphlets are being prepared on practical sanitation, methods of spread of disease, and personal hygiene, and, most important of all, real constructive home making. A great increase should be made in our present stock of photographs, moving pictures, and stereopticon slides for lecture work. All school papers are being encouraged to publish health items in such effective manner as has already been done at several places, especially at the Cheyenne and Arapaho superintendency.

Another competitive composition contest is being prepared for this year, this time on the subject of home making. This will be the important health study among the children this year as tuberculosis was last.

No work is nobler or more necessary or more trying in the work of the Indian Service than that of the field matrons and women industrial teachers. During the past year 5,000 Indian families have been instructed in the care of children and homes by 78 field matrons and their assistants. The help given by these women varies from instruction in sanitation to the supervision of expenditures and the settlement of domestic difficulties. They save the lives of many children. This work of the women among the Indian women in their homes should, I believe, be erected into a special department of the Indian Service. Conferences among the field matrons, as conferences in other lines of our work, have proved most productive of increased efficiency. As one result of the conference of field matrons held during the last year, they are cooperating in the collection of data on the plays and games of Indian children at home, with a view to laying sound foundations for the physical needs as to recreation of the Indian children in the schools. A special civil-service examination has been planned for a position in the Indian Service of teachers of housekeeping, in order to try to obtain more and more competent employees for this branch of the service. This examination will be extremely practical. It is planned to send circulars announcing this examination among all the settlement workers in the country, and among the workers of all other organizations of the country engaged in practical betterment of living conditions, whether of a religious character or not.

INDUSTRIES.

At the present time there is not sufficient statistical information before the office to show precisely what has been done in industrial lines during the past year. From the reports which are being received and analyzed as rapidly as possible, there appears, however, to have been a steady increase in farming, stock-raising, and industries generally. In some places this increase has amounted to a genuinely popular movement. It must be remembered that Indians

are not as antagonistic to work, and particularly to farming, as has often been represented. In time long ago, before the aggressions of whites, and before the constant movement of Indians from place to place kept their roots torn up, the Indians were in a very great number of cases efficient agriculturists, at least to the extent of a year-by-year self-support. Now that their homes are becoming really their own, and the Government is doing everything its means and skill permit to assist them at getting a start, these roots are striking more and more into the ground with fresh vigor.

* * * * * * *

STOCK RAISING.

In addition to the farmers, 47 stockmen were employed at those reservations where the Indians have important stock interests. The duties of farmers and stockmen are identical, so that those employees carried as farmers oversee also the live-stock interests of these Indians and those carried as stockmen superintend also activities in farming.

Plans for the upbreeding of the Indian stock along practical lines are now under way. As a first step in that direction a letter has been sent to the reservation superintendents, in which their attention is especially called to the necessity of upbreeding the horses and the elimination of the worthless ponies. A plan of capture and control and upbreeding has been also formulated and sent to the employees at the various reservations for their information and guidance.

One of the principal subjects of discussion at the Navajo conference, referred to under the subject of farming, was the live stock belonging to the Navajo Indians. It is estimated that the Navajo Indians own the following stock:

	Values.
327,300 horses (ponies)	$3,312,400
3,290 mules	98,000
4,900 burros	13,250
27,700 cattle	571,500
140 bulls	3,400
1,429,821 sheep	2,924,960
318,955 goats	497,910

It is estimated that 3,375,000 pounds of wool, valued at $429,375, were clipped from native sheep, and 293,463 pounds, valued at $35,664, were clipped from graded merino sheep.

A plan has been outlined for improving the breed of sheep belonging to these Indians by the introduction from time to time of a limited number of high-grade Rambouillet and Cotswold rams into their flocks, with the hope that the improvement in the native sheep may be so apparent that the Indians of these reservations will, of their own volition, adopt methods of improving their flocks. The aim is not only to increase the size of these animals so as to make them more desirable for mutton, but to improve the quality and amount of the wool so that the present clip of 3 or 4 pounds per animal may be increased to at least double that amount.

The Indians of the Blackfeet Reservation sold, during the last six months of the fiscal year 1911 and the first six months of the fiscal year 1912, 6,598 head of cattle, for which they received $292,160.96,

and 1,044 head of horses, for which they received $49,949, making a total for all sales of $342,109.96. An association known as the Blackfoot Stock Protective Association was organized on April 15 with a membership of 43, which was soon increased to 60 members. Any Indian on the reservation may become a member by subscribing to the by-laws and paying the required membership fee of $5 per annum. The members are required to report to the superintendent the names of any person or persons detected in killing or stealing of cattle of any kind. There is a similar association on the Flathead Reservation, composed of white settlers and Indian stock owners.

Three years ago about 80 head of 2-year-old heifers were issued to the Indians at the Kaibab Reservation. Since this issue was made the number has increased to more than 350 head. During the month of June 42 head were sold, for which $1,330 was received, and there are now on the reservation about 335 head belonging to the Indians.

At Siletz, Oreg., a cooperative creamery has been established in which membership is open to the Indians. One Indian already has stock in the creamery, and others are contemplating becoming members. At Mescalero the Indians sold 3,175 lambs during the year, at $2.75 per head, or a total of $8,731.25. This is the highest price obtained for lambs in the State of New Mexico. The wool clipped from the sheep by these Indians amounted to approximately 30,500 pounds, which was sold at 13 cents per pound, or a total of $4,041.25.

* * * * * * *

INDIAN ART.

Plans are being formulated for the preservation of those native industries that can be properly classed as arts. The making of Navajo blankets, of the high grades of basketry and beadwork, and of pottery are arts which should be preserved and fostered by every means. It is estimated that the annual output of the blankets made by the Navajo Indians from native wool approximates $675,000, and from Germantown wool $36,000; and that 843,750 pounds of native wool are annually worked into blankets by the Navajos.

There are expert basket weavers at a number of reservations, particularly among the Pimas and Apaches in Arizona and some of the tribes in California. The work of an Indian by the name of Dat-so-la-lee, a member of the Washoe Tribe, is famous, and several of her masterpieces have sold for from $150 to $250. A merchant in Carson City, Nev., now has her best basket, valuing it at $1,500.

SCHOOLS.

The boarding schools have been well filled, the enrollment in most cases being in excess of that of last year. This had been accomplished by little or no solicitation on the part of superintendents, many reporting that they made no efforts to procure pupils and were forced at times to refuse admission to eligible children. The plan inaugurated a year ago of having reservation superintendents report to this office a list of pupils eligible for transfer to nonreservation schools is largely responsible for this improvement.

Steps have been taken to effect the transfer of pupils from one reservation boarding school to another when the home boarding

school is filled and a transfer to a nonreservation boarding school is impracticable. Each reservation superintendent has submitted a school census, and from these the office will be enabled to make a careful study of the educational needs on each reservation.

A larger number of Indian pupils have been enrolled in the public schools than ever before. It is frequently reported that they rank with the white children in their academic work. Indian pupils are also improving in their habits of cleanliness, for they now come from more sanitary homes. These two facts have enabled them to earn the respect of the white people in their school associations.

In eastern Oklahoma alone contracts for the education of Indian pupils in the public schools were made with 225 school districts. These contracts were limited to those pupils who belong to the restricted class of the Five Civilized Tribes. This was done because it was presumed that the children of the unrestricted Indians were entitled to attend the State public schools. This assumption is now, however, untenable in view of the fact that the Supreme Court in the cases of Choate *v.* Trapp and English *v.* Richardson has decided that much of the land now held by these citizen Indians is nontaxable and it will be for several years to come. This presents a new question, and it will probably make it necessary for the office to make further provision in the way of day-school facilities for the Indians of eastern Oklahoma.

Probably the most noticeable example of what it is believed must be the "final step" in the education of the Indian youth of the country has been the enrollment of Indian children in the public schools of Washington and Montana, where more than 300 Indian children were enrolled in public schools in and adjacent to the Yakima and Flathead Reservations. It has been but a few years since these reservations were thrown open to settlement by white people, and already more than 20 good public schools have been built in the Yakima country and more than 30 in the Flathead country. Indian children have been enrolled in all grades below the eighth and have been cordially received and well treated. When it is realized that the Yakima and the Flathead Indians are nearly all pure Indian and that it has been but a very short time since their reservations were opened to settlement, it must be acknowledged that all the Indian child needs is a chance equal to that of the white child. The results on these reservations demonstrate this fact and definitely point to the public school as the "way out" for Indian education.

In the academic work the State courses of study have been followed, and the instruction that is now being given in our schools is comparable with that given in the best corresponding schools for white children. Particular attention has been given to the instruction of Indian pupils in English early in their school life. It has been felt that heretofore teachers have been content with very meager accomplishment in the acquiring of a vocabulary by the first and second grade pupils. No teacher should be content unless she has led her pupils into a knowledge of a large vocabulary during the first school year. The early years of child life are the most valuable in acquiring a language, and special effort has been made to increase the efficiency of primary instruction in our schools.

There were purchased for use in Indian schools 30 stereopticons with reflectoscopes. These are just such machines as are used in giving illustrated lectures and are to be used not only for entertainment, but for purposes of instruction. Something like 7,500 slides have been purchased, covering all features of educational work, travel, biography, history, commerce, manufacturing processes, the growth of industries, etc. These will be used as far as practicable in each school, and, with such additional purchases as may be made from time to time, a great source of valuable information will have been provided. To these slides will be added many others made from photographs taken by our school supervisors, who now use cameras in connection with their inspection work. Such scenes or activities at Indian schools as are of educational value or interest to other schools will be used under this general plan.

The contest among the schools in the writing of essays on the subject of tuberculosis has already been referred to on page 25.

Special attention has been given to the instruction of Indian girls. The home conditions of the Indians is one of the most unsatisfactory features of the Indian problem. To affect this directly the character and efficiency of the training given the Indian girls must be improved. The schools have made a careful study of all phases of education which bear directly on the improvement of the girls. It is realized that for them even more than for the boys the instruction should be of an intensive form, for at best girls can be kept in school only for a few years after they have developed into womanhood. Domestic-science cottages have been constructed at a number of schools. Cottage homes are also common. In these a half dozen or more girls live as a family for two or three months at a time, performing all the household duties in connection with the care of the house and the preparation of meals for not only themselves but others, either pupils or employees. Special attention has been given to procuring efficient women instructors who can direct Indian girls in such practical training as they should have in home making.

Industrial instruction for boys has already been given very careful consideration, and this feature of the school work continues to be the marked characteristic of Indian schools.

More emphasis has been placed on the physical development and health of Indian pupils during the past year than at any other time during the history of Indian education. Outdoor playground apparatus has been furnished for many of the boarding schools and for even a large number of day schools. The Russell Sage Foundation, in cooperation with the National Recreation and Playground Association, appointed a committee to cooperate with this bureau in a study of the communal life of Indians, particularly in respect to their social and recreational activities. This committee was headed by Prof. George E. Johnson, of Pittsburgh, Pa., superintendent of the recreation and playground association of that city. He has given special attention to these phases of Indian life in their relation to the present educational scheme for Indians, and his interest and assistance in this respect has added new zeal and definiteness to this subject. Prof. Johnson made a two months' visit to the Indian field for the purpose of ascertaining our needs. This is the beginning of a special effort

on the part of the Indian Office to deal more effectively with the social and recreational development of Indians through the schools.

Of all the sleeping porches constructed at Indian schools prior to June 30, 1912, approximately 90 per cent were constructed or under construction during the year 1912 itself. In this way we have kept pace with our ruling of last year, that the cubic air space for each child in dormitories should be 500 instead of 400 cubic feet; thus producing at once better conditions within the buildings and adding the inestimable advantages of outdoor sleeping at 17 schools during the last year.

Indian-school employees are alive to the necessity of imparting wholesome instructions in all those virtues which are essential in any young life and in the acquisition of which our schools are deeply concerned. This sort of training is accomplished not only by the formal instruction the teachers have been directed to impart and in the preparation of which they have been assisted by being given access to the best literature on the subject, but by their own example in their social life in the school.

The human element is one of the most important in the education of the Indians, and the office has given attention to the matter of improving the efficiency of its employees. Teachers were requested to prepare theses on subjects related to their work, and this has resulted in inducing them to do more professional reading than they have been in the habit of doing. They have been encouraged to ally themselves with the educational associations of their community and to adopt the most improved methods used in white schools in their classroom work.

In order to induce better qualified employees to enter our schools, the supervisors have visited educational institutions of a high standard throughout their districts and acquainted the young men and women who are about to leave them with the needs of the Indian Service in the way of more efficient instructors. The supervisors have reported that the authorities of the institutions have accorded them every opportunity to talk to the students, and it is believed that a larger number of efficiently trained men and women will thus be induced to qualify for our service.

Particular attention has been given to the efficiency reports on employees. A plan has been initiated of gathering more material from the teachers themselves in the way of theses, outlines, etc., and from supervisors and superintendents. This will afford the office an opportunity to distinguish more accurately between those who are doing highly efficient work and should be advanced and those who are clearly inefficient and should be relieved.

There were purchased for the use of teachers and other employees reference libraries for 80 Indian schools. There are 135 volumes in each set, covering every phase of industrial training and allied subjects. These, with such books as were previously available at each school, will afford an ample opportunity for the school instructors to make their work effective and up to date in every respect.

A supervisors' conference was held during the first days of July, 1911, for the purpose of making definite plans for the school year; it adopted an outline or plan for the year's work. With a few exceptions—the designation by the office of a special school in each super-

visory district in which to enroll orphans; making provisions for a special examination to secure eligibles for the position of principal; limiting the employment of teachers to the actual school term of nine months; and the study of each Indian reservation with respect to proposed legislation governing the taxation of Indian lands thereon for the support of public schools—every principle set out has been followed closely by the office in administering school matters and may now be considered accomplishments for the school year.

The question of fire protection has been given very careful consideration. Although no loss of life has ever occurred in an Indian school as a result of a conflagration, great precautions have been taken to prevent a fire disaster. In boarding schools both day and night fire drills have been ordered, and regulations have been issued looking to the matter of keeping all fire apparatus in perfect condition. All dormitories are provided with fire escapes, and doors behind which any considerable number of pupils ever congregate are made to open outward. The practice heretofore of locking the girls' dormitories at night has been changed, and superintendents of boarding schools have been directed to install, if necessary, electrical burglar alarms for the protection of these dormitories, thus making it unnecessary to lock at night the principal means of exit should a fire occur. Not only have the school supervisors reported specifically in reference to fire escapes and fire-fighting apparatus at each Indian school, but they have also investigated conditions at mission and private schools at which Indian children are educated. Indian children ought not attend institutions where there is not offered ample protection against loss of life by fire.

One of our newest activities is to make every effort, both in the school and among the adults on the reservations, in the direction of vocational guidance. Every Indian, like every white man, is best fitted for some one thing. We are trying to find that thing.

The greatest investment the Indian service has is in its so-called returned students. These are students who have been at our larger schools and have returned to live on or near their home reservation. Throughout the Indian country to-day there are probably 35,000 of these returned students. Superintendents frequently consider these persons merely trouble makers, forgetting entirely that the reason they are frequently protestants is that they have seen better things, but have not quite found their own way to them; and I am sorry to say that frequently the greatest obstacle to their finding their way lies in the Government machinery and personnel itself. Taking into account the length of time that each one of these young people spends at Government schools and the cost per year, the Government has an economic investment in each one of these returned students of from ten to fifteen hundred dollars. Every Indian school in the country should consider it a vital part of its daily work to keep track of the students who have attended it. In cooperation with the systems of following up these students, which are being adopted and improved steadily by the schools, the supervisor of Indian employment is performing what is perhaps his most important function. As he puts it—

> These returned students are the hope of the "Indian problem." * * * It is an economic waste not to follow this investment up with at least some cor-

respondence and friendly advice and, if necessary, some financial assistance, at least to the extent of assisting them to reach some favorable point of employment once. We would hardly thing of spending a similar amount in training a race horse and then turn him loose under unfavorable range conditions to shift for himself. We should want at least to make some use of his training.

More and more Indians are likely to turn to day labor or trade for their livelihood, and it is a nice problem with every reservation superintendent to be a true friend to each Indian in his decision whether to tackle his allotment or some outside job. Every effort is being made to use Indians on our Indian service irrigation projects, even where the result is to make these projects a little more expensive. The educational good to the Indian more than outweighs the additional cost, where there is such. The United States Reclamation Service in the work it does on Indian reservations has done great things in encouraging Indian labor.

* * * * * * *

LAW AND ORDER.

The general conditions of law and order have been good throughout the Indian country, but an affair took place during the course of the year which I deem worthy of special comment. It is with a keen sense of loss, both personal and on behalf of the service, that I have to report that Mr. Will H. Stanley, superintendent of the Soboba Reservation, was shot and wounded by Indians under his jurisdiction on May 2, and died on the morning of May 3. Mr. Stanley had a record in the Indian Service for effective devotion to duty. The Indians charged with this crime are now awaiting the action of the Federal court, and it is to be hoped that their guilt or innocence will soon be determined.

I have continued the fight against gambling among the Indians and am glad to say that our efforts are beginning to bear fruit. By the gradual modification of Indian dances and fiestas, and leavening of them with agricultural fairs, I feel that a step has been made in the right direction, which will result in much benefit to the Indians.

SUPPRESSION OF LIQUOR TRAFFIC.

Through our service for the suppression of the liquor traffic among Indians, which underwent several changes during the past year, the war against the sale of liquor to Indians and its introduction into the Indian country was waged with continuous vigor and successful results.

Mr. William E. Johnson, chief special officer, resigned from the service in September and was succeeded by his assistant, Mr. Harold F. Coggeshall. Upon Mr. Coggeshall's subsequent appointment as superintendent of the Santa Fé Indian School he was succeeded by his assistant, Rev. C. C. Brannon, as acting chief special officer. Later, Mr. Henry A. Larson, one of the special officers, was selected as chief special officer, and has rendered effective and efficient service.

There was available for this work $75,000, and its expenditure had the following results:

New cases during the fiscal year 1912	1,480
Cases pending July 1, 1911	846
Convictions	1,002
Dismissals	267
Acquittals	32

An increased activity was the order of things in several communities, owing to the favorable construction of the law by the courts or legislation by Congress. By reason of the decision of the Circuit Court of Appeals for the Eighth District in the case of United States Express Co. *v.* Friedman, wherein it was sought to compel the defendants to accept shipments of liquor into those portions of Oklahoma covered by the provisions in the enabling act and constitution of the State prohibiting the introduction of liquor for a period of 21 years, an opportunity for additional operations was presented. As there are many Indians residing in that territory, our efforts have been materially increased to protect them, and the Department of Justice and the chief special officer placed additional deputies in this territory with a view to taking every step practicable to protect them and enforce the law. The same questions of law were subsequently passed upon by the Supreme Court of the United States in its refusal to grant a writ of habeas corpus to one Charley Webb.

Such a situation has developed in Oklahoma that an additional appropriation of $25,000 has been asked and recommended for our operations in that State.

Another peculiar situation developed through the admission of New Mexico into the Union. Congress provided in the enabling act that the sale, etc., of liquor to Indians and its introduction into the Indian country, "which term shall also include all lands now owned or occupied by the Pueblo Indians of New Mexico," are forever prohibited. Congress also provided that the terms Indian and Indian country shall include the Pueblo Indians of New Mexico and the lands now owned or occupied by them. These provisions were embodied in the constitution of that State. Our endeavors to enforce the law brought into question the constitutionality of the legislation of Congress, and the United States district court very recently held that the statute is unconstitutional. An appeal will probably be taken.

The Federal court for the district of Oregon has declared unconstitutional that part of the act of Congress applying the 25-year liquor clause to lands already allotted or disposed of on the Grande Ronde and Siletz Reservations, so that under this ruling our work to protect these Indians will be somewhat hampered.

By reason of the broad scope of the liquor laws applicable to Oklahoma and New Mexico, and the provisions inserted in the legislation extending for a period of 25 years the Federal liquor laws to the reservations which have been or are being thrown open to settlement, many applications for permits to introduce liquor for medicinal purposes and wines for sacramental purposes were received, and as, under the provisions of existing law, authority to grant permits is not conferred upon this department, applicants were referred to the War Department; a provision was placed in the Indian bill,

however, declaring it lawful to introduce wines into the Indian country for sacramental purposes.

The situation in Minnesota, so far as our operations are concerned, changed but little. The condition among the Indians has become worse, and reports indicate that the Indians have but little difficulty in obtaining liquor. As about 75 per cent of the Indians in that State are citizens, and operations under the provisions contained in the various treaties with the Chippewa Indians have been held in abeyance pending the final determination of the case of Geralds et al. *v.* Johnson et al., our only hope lies in the enforcement of the State law. Our work along this line, however, has been to a certain extent hampered by the passage of a law by the State declaring it to be a misdemeanor to employ a decoy.

Decoys are in many instances as essential in our work to suppress the sale of liquor to Indians as a special officer. It requires the services of the officer to procure the evidence and the services of the decoy to produce the evidence. There are innumerable instances where the officer has every reason to believe that certain individuals are trafficking in intoxicating liquors with the Indians, and yet it is next to impossible to procure evidence of that fact sufficient to warrant prosecution. In such instances the decoy, who in every instance should be a person about whose race there is no question, is an essential element and renders valuable service.

I have taken steps to eliminate to a certain extent one of the objectionable features of this work, and which has been the subject of criticism. Heretofore many deputy special officers were employed on a fee basis, namely, they were paid a certain fee for a certain service performed. While this method still continues, it has been reduced and the chief special officer authorized in its stead to employ deputy special officers on a monthly basis at varying salaries, at not to exceed $75 per month. It is hoped in the near future entirely to eliminate the fee system.

I ought also to report that we were successful in securing a conviction in this city for the sale of liquor to Indians, showing two things, namely, that the Indian, though hundreds of miles distant from his home, has not lost his lust for firewater, and is able to procure it under the dome of our Capitol, and that the laws as now in force are applicable anywhere.

The Indians continue to appreciate our efforts in their behalf, as shown by the petition of the Lac du Flambeau Indians for the enforcement of the provisions in the treaty of 1842 applicable to Wisconsin regarding the sale of liquor to Indians. The fact that the case of Gerald et al. *v.* Johnson et al. was undisposed of prevented the office from taking any action on their request.

Concerning peyote or mescal, the office has continued its endeavors to obtain information from every available source, and believes that it is in a position to submit a recommendation for definite action within a short time. The Indians, realizing the stand this office has taken, have submitted several petitions, praying that no action be taken whereby they will be deprived of the use of peyote, and they have sent delegations to Washington, whose sole mission was to present their point of view.

ADMINISTRATIVE PLANT.

The estimated value of the Government plant, including chiefly agency and school buildings, is upward of $9,000,000. The amount of money available for repairs and general up-keep is $180,800, or 2 per cent of the estimated present value. Many of the buildings are reconstructed forts; many of them are in sections of the country where storms are heavy; the occupants of the buildings, both Indians and whites, are perhaps not quite so careful as other communities. These, among other causes, make it a fact that Indian Service buildings have to sustain a higher rate of depreciation than is allowed in the usual tables of depreciation. It is poor economy for the Government, and demoralizing as an example to the Indians, not to keep the buildings up to their value when constructed. I feel that a general provision of 5 per cent of the cost of buildings should be made annually for repairs, and in special cases a larger percentage will be required. After these ordinary repairs are made the depreciation on the service buildings should be carried at 2½ per cent for brick buildings and 5 per cent for frame buildings.

The estimates for repairs and improvements submitted by superintendents for the fiscal year 1913 have been submitted in a much more businesslike manner than in past years. The old habit of asking for an inflated amount in the hope of getting a part of it is happily dying out, and both the office and the superintendents in the field are more fully than ever before realizing that the way to get appropriations from Congress is to make a businesslike statement of actual needs in a form that can be substantiated in every detail.

Much important work has been postponed for several years because it has been found impossible to make the appropriations provided by Congress go round. In construction work, distance from civilization frequently much increases the cost. Contractors find it difficult to secure workmen, and material has to be transported long distances over bad roads.

An effort is being made to simplify the method of handling the less important projects by soliciting informal proposals from builders located reasonably near the proposed work and having the superintendent submit them for approval to the office. In this way it is possible to save often much time and money, and the fact that more work is being done in the open market than usual saves still more time and money.

Contractors complain that it requires too much capital to handle the Indian work on account of the time required in securing payment for work done after the certificate is issued which entitles them to payment. This certificate provides that payment for work done shall be made in installments, the contractor to be paid 80 per cent of the value of the work at the time the certificate is made; the Government retains 20 per cent until the work is entirely completed and accepted. A change should be made in the method of making payments. The money should be available as soon as the certificate is made, as is not the case under the present routine. It is my opinion that the bonded superintendent should be authorized to issue a check for the amount due on all partial payments; the final payment only should be directly authorized by the Indian Office.

Contractors of moderate means would thus be in a position to compete for the work of this bureau.

* * * * * * *

THE PROPERTY OF THE INDIANS.

The property interests of the Indians constitute one of the greatest estates ever held in trust by any organization, governmental or private. Including the lands, forests, water powers, minerals, and funds held in tribal or individual ownership, the Indians' principal amounts to approximately three-quarters of a billion dollars, and from this property in rentals and interest there comes annually approximately $12,000,000.

USE OF CEDED LANDS.

Under various acts passed by Congress within recent years certain lands ceded by the Indians to the United States are open to settlement and entry, and the Government endeavors to dispose of them at their appraised value for the benefit of the Indians.

Nearly all of such acts contain a clause practically identical with the following:

> That nothing in this act shall in any manner bind the United States to purchase any portion of the lands herein described, * * * or to dispose of said land except as provided herein, or to guarantee to find purchasers for said lands or any portion thereof, it being the intention of this act that the United States shall act as trustee for said Indians to dispose of the said lands, and to expend and pay over the proceeds received from the sale thereof only as received and as herein provided.

It has been the practice to consider such lands under the jurisdiction and supervision of the General Land Office from the passage of the act, and the Indians' title thereto extinguished. On this theory the public at large has come to consider said lands a part of the public domain, and the lands have therefore been used indiscriminately by various interests, principally for grazing purposes, without compensation to the Indians.

By departmental decision of November 27, 1911, it was held in effect that the Indians' title to such lands is not extinguished until date of entry, settlement, or sale, and the Indians are entitled to their use, or to any revenue that may be derived from their use by others, pending date of settlement, sale, or entry.

Following this decision the matter was considered jointly by representatives of this office and the General Land Office, and a set of regulations has been drafted to provide for proper concurrent jurisdiction and the collection, for the benefit of the Indians, of grazing fees from the users of the lands pending actual settlement, entry, or sale.

It is believed that the regulations when put into effect upon the various reservations where applicable will be the means of securing to the Indians large sums of money which heretofore have been lost to them, without interfering with the speedy sale or other disposition of the lands as provided by Congress.

FORESTRY.

During the past year particular attention has been given to construction work on the Indian reservations for the purpose of increasing the efficiency of fire protection and administration of timber matters. The timbered areas on the reservations are being districted as far as practicable for the purpose of patrol and administration and a forest guard assigned to each district and placed in charge, under the superintendent, of all timber matters in his district. Permanent headquarters are being established in these districts, telephone lines constructed connecting the headquarters with the agency, and roads and trails constructed throughout the timbered areas so as to render fire patrol easier. A number of fire lookout stations have been constructed on the reservations to furnish readier means of detecting forest fires. A large amount of construction work is still needed to properly protect the timberlands from fire.

The record of forest fires is kept by the calendar year instead of by the fiscal year. For the year ending December 30, 1911, no serious fires occurred. So far as reported, the area burned over on the reservations was 3,549 acres, with a total loss of $3,288. The year 1910, however, was a bad fire year, 671,461 acres being burned over on the reservations, with a loss of $675,227. It is important that the office be not lulled into security by the small loss of last year, but that every precaution be taken to protect the reservations in case of the recurrence of another dry season such as 1910.

Technical men have been assigned to a number of the reservations and placed in charge of the timber work thereon. Forest assistants have been placed in charge of the timber work on the Fond du Lac, Klamath, Navajo, Yakima, and Coeur d'Alène Reservations. Forest rangers have been appointed and placed in charge of the timber work on the Jicarilla, Mescalero, and Fort Apache Reservations, and scale inspectors have been placed in charge of such work on the Bad River and Lac du Flambeau Reservations. These men are held responsible to the superintendent for all timber matters on these reservations.

On the Jicarilla Indian Reservation, in New Mexico, the Indians have been encouraged to take hold of the cutting and manufacturing of railroad ties, with great success. The timber on this reservation is all owned by the tribe, although the land has been allotted. Arrangements were made with the Denver & Rio Grande Railroad Co. whereby they offered to take any ties delivered at certain places by the Indians. The area which the Indians are cutting is rough and inaccessible as a logging proposition. The price paid by the railroad company for ties averages a rate of $15.18 per M, board feet. The Indians have been paying into the tribal fund as stumpage an average of $4 per M, and the cost of supervision amounts to 2 cents a tie, or 70 cents per M. The Indians, therefore, receive for their labor about $10.40 per M. By this method all money except the 70 cents per M., which covers the cost of supervision, goes to the Indians either as stumpage or labor. The Indians are cutting many cull ties in order to make good utilization of the material, for which they receive only one-half price. Some of the Indians are making as high as $3.80 a day. This tie cutting is good, healthy work, and very remunerative to the Indians. During the year they cut approxi-

mately 11,000 ties, receiving a total of $4,464, of which $1,237 was paid to the tribal fund as stumpage, the balance going to the Indians cutting the ties after the cost of supervision, amounting to $221, had been deducted. On other reservations also the Indians have been encouraged to cut the timber on their allotments themselves, delivering the logs at specified points as desired by the purchasers.

On the Tongue River Indian Reservation, in Montana, it was discovered that a large amount of timber was being killed by insects. The total stand of timber on the reservation is estimated at about 400,000,000 board feet, of which approximately 5,000,000 feet was infested. An examination of the timber was made by the Bureau of Entomology. They reported that unless steps were taken immediately to control the insect infestation all the timber on the reservation would be killed, but that if approximately 3,000,000 board feet of the infested timber were removed the infestation would be checked and the remaining timber saved. There was, however, a market for only about 500,000 feet of timber a year near the reservation, and it was therefore found to be impossible to utilize all of the timber which it would be necessary to remove. A contractor was found who agreed to take over the agency sawmill and cut and manufacture the timber at $9.50 per M, board feet. There was not sufficient money available to log and manufacture all of the infested timber necessary to be cut, and therefore only about 500,000 feet are being manufactured at the present time. The balance is being cut and barked, and as the timber now being manufactured is sold and the money from the sale of the lumber becomes available the logs now left in the woods will be brought to the mill and manufactured. The brush resulting from the logging is being piled and burned as the cutting progresses.

On the Jicarilla Indian Reservation, in New Mexico, 130,000,000 feet of timber were advertised for sale, the advertisement running 90 days. No bids were received for this timber, but a few days later it was sold at private sale at the minimum rates stated in the notice of sale, $3 per M for the first six years and $3.50 per M for the last three years of a nine-year cutting period. Another sale, amounting to 30,000,000 board feet, was advertised on the same reservation at a minimum price of $3 per M for a six-year cutting period. But one bid was received, at the rate of $3.50 per M. This bid was rejected, owing to the fact that the Indians have become interested in the cutting and manufacture of ties near this area and that the sale already made will furnish sufficient money to take care of the Indians on the reservation as far as the proceeds from the sale of timber can be used for this purpose.

On the Fort Apache Indian Reservation, in Arizona, 300,000,000 feet of timber were offered for sale in conjunction with an offer by the Forest Service of an equal amount of timber on the adjacent Apache and Sitgreaves National Forests. This timber was advertised for 120 days. But one bid was received, at the minimum rates stated in the notice of sale, $2.50 per M for the first five years and $3 per M for the last five years of a 10-year cutting period. This bid was accepted by the department. The company deposited a check for $5,000 at the time of their bid, but have since failed to execute their contract and bond.

The Indian timberlands, known as the "Forest Reserve," in the Choctaw Nation, Okla., amounting to approximately 1,279,910 acres, were offered for sale during the year under sealed bids. The offer was made in two ways, one for land and timber together, the other for the timber 11 inches and over in diameter without the land, the area being divided into 24 tracts. The sale was widely advertised for 120 days, and a number of bids were received. After the notice of sale had been started it was reported to the office that valuable deposits of manganese had been found on two of the tracts offered for sale. An investigation was made by the Geological Survey. While they reported that the manganese deposits were probably not of commercial value, their presence was deemed sufficient to warrant the rejection of bids on these particular tracts. The prices offered for the other tracts were only slightly in excess of the appraised value, and were made in such a way as to make it seem advisable to reject them all. Accordingly, all bids were rejected for these lands by the department on May 15, 1912.

In addition to these sales which were advertised, offers have been received for certain timber on the Klamath Indian Reservation, amounting to approximately 400,000,000 board feet. A careful examination of this timber was made by the office, and it seems probable that a sale should be made. An offer for timber on the Quinaielt Reservation was rejected by the office after an examination which showed the timber to be worth much more than the price offered. An offer was also received for approximately 40,000,000 board feet of timber on the Nez Percé Reservation. It is believed that by a careful administration of these timberlands, which were reserved for the use of the tribe by the act of August 15, 1894 (28 Stat. L., 327, 330), a steady income of over $10,000 a year can be obtained from the sale of mature timber and the leasing of grazing and agricultural lands. Inquiries have been received regarding timber sales on other reservations, notably the Santa Clara, Yakima, and Mescalero. Increased activity is looked for in the sale of timber next year.

The operations on the Menominee Reservation, in Wisconsin, have been continued with increasing success. Railroad logging, which is now being carried on, insures the mill a steady supply of logs when needed and has reduced the cost of operations. During the year 25,965,670 feet of timber were logged and 42,956,057 feet of lumber manufactured at the mill; 25,097,331 feet of lumber, 6,840,900 lath, and 2,480,750 shingles were sold, and 1,176,996 feet of lumber were used in construction. At the close of the year there were on hand 42,930,847 feet of lumber in the yards. The total receipts from all products during the year were $509,547.54 and the total disbursements were $411,400.83, showing an excess of receipts over disbursements of $98,346.71, compared to $11,200 last fiscal year. The cost of logging and manufacture compares more than favorably with other mills operating on the same scale in Wisconsin. During the year an average of 219 Menominee Indians were employed at the mills and in the woods, as compared with 205 the preceding year. They earned $71,048.65 in wages.

Logging operations were continued through contractors on the Bad River, Lac du Flambeau and Fond du Lac Indian Reservations, in Wisconsin, and upon the ceded Chippewa pine lands in Minnesota

as well as on a smaller scale on other reservations. On the Bad River Reservation 61,897,915 feet of timber were cut, yielding $430,559.16. Upon the ceded Chippewa lands in Minnesota 429,720,339 feet were cut, yielding $2,987,927.37.

By proclamations dated February 17, 1912, the President restored to certain Indian reservations all those portions of said reservations which were placed in national forests by proclamations of March 2, 1909, the restoration to take effect March 1, 1912. The reservations affected are as follows: Fort Apache, Hoopa Valley, Jicarilla, Mescalero, Navajo, San Carlos, Tule River, and Zuni. The area covered is approximately 2,486,000 acres of land. It is estimated that there are 10,826,180,000 board feet of merchantable timber, 2,500,000 cedar posts, and 875,000 cords of firewood on these lands, valued at approximately $18,581,800. The value of the land itself, at a conservative estimate, is $5,000,000. There are approximately 35,000 Indians on the reservations affected by these withdrawals.

IRRIGATION.

The appropriations for irrigation work for the fiscal year 1912 were a little over $1,300,000, of which amount nearly $1,000,000 is reimbursable to the Treasury when the irrigated lands shall have been put in successful cultivation and the Indians have become self-supporting.

Important construction was carried on at Fort Hall, Idaho, where the system has been completed with the exception of a few short and inexpensive laterals. During the year water was furnished to about 8,155 acres, showing an increase of 3,286 acres, of which increase 455 acres are Indian lands.

On Crow Reservation, Mont., construction was continued on the Agency Canal and Little Big Horn No. 2 Canal, including necessary structures. Necessary maintenance and repairs were continued on Big Horn Agency, Lodge Grass, Pryor Creek, and other canals and ditches, which consisted in replacing the old wooden structures with concrete.

At Fort Belknap, Mont., several timber structures were put in during the year and repairs made to others. A new concrete headgate for the Milk River Main Canal was completed during the year.

The construction on the pumping plant to irrigate about 6,000 acres of the best land on the Colorado River Reservation was under way during the entire year. The pumping plant has been completed with the exception of part of the building. About 8 miles of the canal system have been completed.

On the Fort Mojave Reservation two pile jetties were constructed for the protection of valuable agricultural land from the encroachment of the Colorado River. These jetties, while not permanent, diverted the current of the flood sufficiently to prevent further damage.

Work was continued on the extension of the Spring Creek ditch for the irrigation of the Southern Ute allotments, about 8½ miles of ditch and laterals having been completed. The only feasible project for the diminished Southern Ute Reservation has been constructed during this year for a distance of about 3 miles, covering about 600 acres.

No construction work was done on the San Juan project in New Mexico, all efforts being confined to repairing damages caused by excessive floods during the year.

On the Uintah Reservation, Utah, new work has been confined to the construction of such laterals as were required for present use; necessary maintenance and operation has been done, the force having been reduced accordingly.

On the Yakima Reservation, Wash., the drainage work started during the fiscal year 1911 was practically completed during the fiscal year 1912. Machinery was used almost exclusively, moving during the year a total of over a million cubic yards of material at an average cost of 8.34 cents per cubic yard. These ditches have drawn off water from a large area of land which has been producing crops by subirrigation. The irrigation activities have been restricted to operating and maintaining the system, no new work having been undertaken on account of the condition of the water rights. In this connection it should be mentioned that at the close of the year there was developed near the geographical center of the irrigable area a large artesian flow at a depth of 510 feet.

On the Diminished Wind River Reservation, Wyo., construction of laterals and concrete headgates has been carried on. In view of the necessity of making beneficial use of the waters under ditches already constructed, the irrigation force has been reduced to that required for the maintenance and operation of the system.

Work was under way on several of the Mission Reservations in southern California and the pueblos in New Mexico.

During the year investigations by the engineers of this service for power and storage projects were made on practically all the Indian reservations. Most of the reports have been received, and appropriate orders for withdrawals necessary will be submitted in the near future.

MINERALS ON INDIAN RESERVATIONS.

Save important deposits of gold, coal, oil, and gas on the Wind River Reservation in Wyoming, all the lands of Indians containing valuable minerals are located in Oklahoma among the Five Civilized Tribes, Osage, Oto and Missouria, Sac and Fox, and Ponca Indians.

Though the existence of petroleum and natural gas in the Indian Territory (now Oklahoma) was known for many years, but little real development of the region took place prior to 1903.

Among the Five Civilized Tribes one of the greatest oil fields in the world has been developed, largely under departmental leases. The production for a number of years has been approximately 40,000,000 barrels per annum. Since the removal of restrictions on the alienation of lands by the department May 27, 1908, a large percentage of these leases has been made direct by the Indian owners free from departmental control. However, during the past year, approximately 13,000,000 barrels of oil were produced from leases supervised by the department, and the royalties collected on oil and gas during the past year amounted to $851,097—most of which was received from leased lands in the Cherokee and Creek Nation.

On the Osage Reservation oil and gas operations are conducted under the Edwin B. Foster lease of March 16, 1896, which expired by

limitation March 16, 1906. Congress, by act of March 3, 1905, extended this lease and a number of subleases thereof for a period of 10 years, and limited the lands embraced therein to 630,000 acres in the aggregate. During the past year 9,446,060.10 barrels of oil were produced, and a royalty of 12½ per cent thereon paid to the Indians amounted during the period mentioned to more than $656,000.

By section 3 of the act of June 28, 1906, authority was granted for the leasing for mineral purposes of that part of the Osage land not covered by approved subleases under the act of March 3, 1905. The regulations governing the leasing of these additional lands (aggregating 800,000 acres) for oil and gas purposes were approved by the department July 3, 1912, and provide for the offering of the lands under sealed bids. The royalty fixed by the President for oil is 16⅔ per cent. As yet no leases have been approved under the new regulations.

Comparison of the productions for the years 1911 and 1912 show that there was very little increase therein, but that a larger amount of money was received during 1912, which was due to an advance in the price of oil.

On the Oto and Missouria, Sac and Fox, and Ponca lands in Oklahoma, about 165 oil leases have been entered into, embracing 41,400 acres, on which royalties amounting to about $11,000 have been paid to the Indians.

On the Wind River Reservation, Wyo., prospecting and development of lands leased for coal, oil, gas, and asphalt have been in progress, but no discoveries of value have been reported during the year. One of the producing coal mines on the reserve temporarily suspended operations in December, 1911, on account of the thin strata of coal encountered. During the years 1907 to 1911, inclusive, there was mined from 640 acres of leased land approximately 318,000 tons of coal, for which the Indians received about $37,000 in royalties. During the past year 17 leases, aggregating 1,111.24 acres, were approved for gold placer mining on the reservation, but as yet no reports have been received as to the value of the minerals, if any, taken therefrom.

Most of the lands containing coal deposits are located in the Choctaw and Chickasaw Nations. The Choctaw-Chickasaw agreement of July 1, 1902 (32 Stat. L., 642), provided that no leases of coal and asphalt lands should be made after its ratification September 25, 1902; and the Congress, by act of April 26, 1906 (34 Stat. L., 137), reserved from sale all such lands, whether leased or unleased, until the expiration of existing leases thereon, or until such time as might be otherwise provided by law. The area of the segregated coal lands in the nations mentioned is 445,000 acres, of which about 100,000 are under leases dated between July 11, 1899, and September 16, 1902, and running for terms of 30 years from their dates. The total estimated value of the surface of the land and coal deposits varies from $19,000,000 to $100,000,000 according to the experts who made the examinations. Twenty-eight thousand eight hundred forty-eight tons of coal were produced from leases in the Choctaw Nation, royalty for which amounted to $2,308. In the Creek Nation about 78,000 tons of coal was mined, on which a royalty of $6,000 was paid.

Valuable limestone deposits were discovered on the Tuscarora Reservation in New York, the value of which was estimated by the

Geological Survey at about $630,000. A bill was introduced at the last session of Congress to authorize the leasing of the land containing the deposits, the price offered being $58,000 for the 250 acres of limestone. An adverse report was made by the department on the bill for the reason that the consideration was not deemed adequate, and an amendment thereto was suggested to authorize the sale or lease of the lands under such regulations as the Secretary of the Interior might prescribe.

Although the Tuscarora Indians own their lands in fee, the Attorney General has decided that they can not lease the same unless authorized so to do by Congress.

ALLOTMENTS.

During the year allotments have been approved to 651 Indians, covering 124,000 acres.

This number of allotments approved during the year is small, due largely to the fact that before recommendations covering approval of lands allotted to Indians can be submitted a report must first be obtained from the Geological Survey to show whether the lands allotted contain any coal or other mineral or whether any power site or reservoir possibilities exist therein. While in a number of cases information already on hand at the Geological Survey enables that bureau to certify as to the character of the land allotted, yet in a large number of cases the Geological Survey advises that field examinations will be necessary before definite information can be furnished as to the mineral or nonmineral character of the lands involved. For instance, on the Fort Peck Reservation the allotment work in the field has been completed, and 1,987 Indians have been allotted something over 700,000 acres. Partial returns from the Geological Survey show coal lands falling within 15 townships of this reservation aggregating 277,923 acres. Eighty-nine townships have been reported, in whole or in part, as noncoal, nonoil, and nonmineral. Ten townships remain yet to be reported on, and as data is not available to show the mineral or nonmineral character of the lands the suspension of the approval of the allotments will be necessary until field examinations have been made by the Geological Survey.

This condition exists also in connection with lands in the Blackfeet Reservation, Mont., within which 2,623 Indians have received allotments in the field aggregating 822,984 acres.

The field work in connection with allotments in severalty has progressed satisfactorily during the fiscal year, and in addition to the completion of allotment work on the Fort Peck and Blackfeet Reservations in Montana, it is expected that the allotment work at Fort Hall, Idaho, Yakima, and possibly the Colville Reservation, Wash., will be completed during the working season of the present calendar year. To May 30, 1912, 1,544 allotments of irrigable lands, covering 32,000 acres, and 3,303 allotments of grazing lands, covering 210,400 acres, had been made within the Fort Hall Reservation, leaving approximately 231 irrigable allotments and 472 grazing allotments yet to be made. On the Colville Reservation, Wash., 1,266 Indians have been allotted 139,771 acres. While the total area within this reservation is large, approximately 1,297,000 acres, yet a large part of the land is rough, mountainous, and unsuitable for allotment

purposes. The field men connected with this work have heretofore advised that when all Indians entitled have been allotted there will remain but little, if any, desirable land for homestead settlement. Of the lands within the Fort Peck Reservation, Mont., at least 1,000,000 acres surplus will be available for disposal under the act of May 30, 1908 (35 Stat. L., 558), and on the Blackfeet Reservation approximately 700,000 acres will be placed on the market in accordance with the act of March 1, 1907 (34 Stat. L., 1035).

That part of the Fort Berthold Reservation lying north and east of the Missouri River in North Dakota has been allotted, and the surplus lands, other than those classified as coal, disposed of under the provisions of the act of June 1, 1910 (36 Stat. L., 455). The Geological Survey has reported 238,082 acres within that part of the reservation lying north and east of the river as valuable for coal, of which 73,000 acres were allotted to Indians under the provisions of the act mentioned and joint resolution No. 23, approved April 3, 1912.

Special allotting agents, William Williams and John F. Armstrong, have been engaged recently in aiding the Navajo Indians in Arizona and New Mexico to procure their applications for allotment on the public domain under the provisions of the fourth section of the general allotment act of February 8, 1887 (24 Stat. L., 388).

During the year allotment work has practically been completed within the Yuma Reservation, Cal., and Rosebud and Standing Rock Reservations, S. Dak. and N. Dak. Within the Pine Ridge Reservation, S. Dak., allotments have heretofore been made to 5,444 Indians, covering 1,778,085 acres. Approximately 2,000 Indians within this reservation remain yet to be allotted, and two years longer, at least, will be required to complete the work.

LEASES OF ALLOTTED LANDS.

(Outside Five Civilized Tribes.)

Leases of allotted lands are authorized by the act of February 28, 1891 (26 Stat. L., 794), and acts amendatory thereof. Under these acts and departmental regulations leases may be made for not exceeding three years for grazing or five years for farming purposes, when improvements are provided for as part of the rental. When the consideration is limited to money alone, the term does not exceed one and two years, respectively. Business leases may be made for five years. This does not include the lands of the Yakima Reservation, Wash., Wind River, Wyo., or Uintah Reservation, Utah. During the fiscal year ended June 30, 1912, 7,077 leases were approved.

Under the act of May 31, 1900 (31 Stat. L., 221–246), the Indians of Yakima Reservation may lease their allotted lands, when unimproved, for 10 years.

Under the act of April 30, 1908 (35 Stat. L., 97), the lands on the Wind River Reservation susceptible of irrigation may be leased for a term not exceeding 20 years. Under the laws of the State of Wyoming the right to use the waters flowing through this diminished Shoshone Reservation in Wyoming will be adjusted on December 31, 1916. There is an area of probably 45,000 acres of irrigable allotted lands on the reservation which, it is believed, the Indians

themselves will be unable profitably to utilize, and to which it will be impossible for them to apply water prior to the date on which the water rights will be adjusted. Plans have been formulated to lease and sell such of the allotments as can not be utilized by the Indians with benefit to themselves.

Under the same act of April 30, 1908 (35 Stat. L., 95) the lands on the Uintah Reservation, Utah, susceptible of irrigation may be leased for a period not exceeding 20 years. Able-bodied male Indians are not permitted to lease unless they are engaged in some self-supporting occupation or are cultivating at least 40 acres of their own allotment. Those, such as minors, women, and old people, who are unable to cultivate any part of their land, either through hired help or male relatives, are permitted to lease.

There are 98,000 acres of agricultural lands under ditch on this reservation belonging to the Indians, only 12,000 of which are under cultivation, either by the Indians or lessees. Plans are being formulated to induce whites to enter into leases for these lands with a view to placing them in cultivation and preserving water rights. The leasing of these surplus lands is important if waste of their resources is to be prevented.

Since the last annual report 45 allottees, who have been represented as being competent to manage their own affairs, have been permitted to make the experiment of leasing their allotments without departmental supervision.

SALE OF INHERITED INDIAN LAND.

Under the act of May 27, 1902 (32 Stat. L., 245–275), as modified by subsequent acts of Congress authorizing the sale of inherited Indian land, 392 tracts, covering 43,652.28 acres, were sold this year for $889,185.02, the average price being $20.30 per acre.

Since May 27, 1902, inherited Indian land has been sold as follows:

Sales of inherited Indian lands.

Year.	Tracts.	Area.	Consideration.	Average price per acre.
1903	.....	44,493.99	$757,173.25	$17.01
1904	1,236	122,222.52	2,057,464.50	16.83
1905	978	90,214.97	1,393,131.52	15.48
1906	643	64,447.67	981,430.87	15.23
1907	820	106,359.25	1,248,793.34	11.74
1908	768	91,302.57	1,302,508.94	14.27
1909	753	102,708.00	1,321,258.72	12.86
1910	873	129,359.61	1,956,315.92	15.12
1911	638	79,665.66	1,503,960.38	18.87
1912	392	43,652.28	889,185.02	20.30

SALE OF ALLOTTED INDIAN LAND.

Under the act of March 1, 1907 (34 Stat. L., 1015–1018), as modified by the act of June 25, 1910 (36 Stat. L., 855), authorizing the sale of land allotted to noncompetent Indians, 324 tracts, covering 34,281.11 acres, were sold during the fiscal year for $567,880.75, the average price per acre being $16.56.

Since March 1, 1907, land allotted to noncompetent Indians has been sold as follows:

Sales of lands allotted to noncompetent Indians.

Year.	Tracts.	Area.	Consideration.	Average price per acre.
1908	92	7,990.88	$159,318.81	$19.99
1909	235	34,060.33	442,762.85	12.09
1910	520	82,655.80	1,245,639.96	15.07
1911	494	56,197.98	978,588.27	17.41
1912	324	34,281.11	567,880.75	16.56

In some cases involving the sale of Indian land it was found upon investigation after the sales papers reached this office that the sale was not for the best interest of the Indian owner. In such cases the sale was disapproved and the superintendent was directed to return the money to the purchaser. The purchaser was therefore deprived of the use of his money for several months. To meet this situation new rules of practice in sales cases have been approved by the department, in that the petition from the Indian owner for the sale of all or a part of his land must be approved by the Secretary of the Interior before the land is advertised for sale. In case the sale covers inherited land, the heirs of the deceased allottee are determined by the Secretary of the Interior before the sale is made. Under this plan when Indian land is offered for sale and the purchaser puts up his money there need be no delay in the approval of the sale, as the only question that will remain is whether the consideration is adequate. The new regulations went into effect in October, 1911, and up to July 1, 1912, 566 petitions for the sale of land were approved.

FEE PATENTS AND COMPETENCY CERTIFICATES.

During the fiscal year 764 applications for patents in fee were received, of which 344 were approved and 420 denied. The area patented embraces 45,529.49 acres. Of the total number of fee patents issued only 38 were issued to full-bloods, and many of the applications were made by allottees of one-sixteenth and one thirty-second Indian blood. In 90 per cent of the fee patent cases the application covered only a part of the allottee's land.

The total number of fee patents issued under the act of May 8, 1906, as modified by the act of June 25, 1910, are as follows:

Patents issued under act of June 25, 1910.

	Approved.	Denied.	Area patented.
1907	889	.....	92,132.50
1908	1,787	68	153,991.78
1909	1,166	767	133,331.79
1910	955	413	99,339.10
1911	1,026	387	114,547.79
1912	344	420	45,529.49
Total	6,167	2,055	638,870.45

Under the provisions of the act of June 25, 1910, which provides for the issuance of certificates of competency to Indian allottees holding fee patents with restrictions on alienation. 22 certificates were issued during the fiscal year covering an area of 1,687.05 acres.

Twenty-two certificates of competency have been issued to members of the Osage Tribe during the fiscal year. A certificate of competency authorizes the allottee to sell and convey any or all surplus lands deeded to him under the provisions of the act of June 28, 1906 (34 Stat. L., 539). Each Osage allottee has approximately 495 acres of surplus land.

But one certificate of competency has been issued to a Kaw Indian during the fiscal year. The certificate authorizes the allottee to sell and convey all lands deeded him under the provisions of the act of July 1, 1902 (32 Stat. L., 636). The Kaw Indians were allotted approximately 480 acres of land each.

Of the 88 Absentee Wyandotte allotments in Oregon 49 have been covered by certificates of competency issued to the allottees on proof of their ability to manage their own affairs. Of these, 20 were issued during the fiscal year ended June 30, 1912. The allotments are for 80 acres each.

In the issuance of fee patents and certificates of competency to Indian allottees and the sale of Indian land the question considered is, What is for the best interest of the Indian owner?

In 1907 and 1908 the issuance of fee patents to Indian allottees was in the experimental stage, and investigations made show that at least 60 per cent of the Indians who received fee patents sold their lands and soon squandered the proceeds derived from the sale. Of the 2,744 applications for fee patents which were received 2,676 were approved and only 68 denied. During these years the recommendation of this office was based solely upon the report of the Indian superintendent that the applicant was competent to care for his own affairs. No other evidence to show the competency of the applicant was required.

In 1909, and since, a greater degree of competency was required to be shown and the superintendent was directed to report in detail, making answer to specific questions as to the past performances of the Indian applicant, his ability to care for himself and family, and the use he intended to make of the land if given a patent in fee.

In 1909, 1910, 1911, and 1912 about 3,400 applications for fee patents were approved and about 2,000 were denied.

As a result of a more strict policy in determining the competency of the Indian applicants, the percentage of cases in which fee-patent Indians failed to make good has been reduced from 60 per cent to about 30 per cent. In nearly all cases where the issuance of a fee patent is recommended by this office the application covers only a part of the Indian's land, and in 90 per cent of the cases the Indian wishes to sell a part of the land to improve the remainder of his allotment.

Questions which arise as to the issuance of fee patents also arise as to the sale of Indian land. Within the past few years a change in the practice of sales cases was put in operation and the superintendent required to make a detailed statement as to the needs

and condition of the Indian, so that the records may clearly show whether it is for the best interest of the Indian owner to sell his or her land. The superintendent is also required to report the use the Indian wishes to make of the proceeds of the sale.

INDIVIDUAL INDIAN MONEYS.

Funds belonging to individual Indians under governmental supervision are derived mostly from the following sources: (1) Sale of allotted and inherited lands. (2) Lease accruals. (3) Sale of timber. (4) Oil and gas royalties. (5) Earnings of outing pupils.

The method of handling individual Indian moneys by depositing them in local banks under a surety bond, subject to the check of the Indian depositor, when approved by the superintendent in charge of the reservation, has been continued throughout the year.

1. *Minors.*—Every endeavor has been made, where parents may not have had ample wisdom but are doing pretty well and taking good care of their children, to conserve the principal, if this could be done without jeopardizing the health of the children or denying the best possible education, in order that the minors might, on attaining their majority, have funds with which to engage in farming or other profitable enterprise. Thoroughgoing justifications were required before the superintendents received authority from this office to approve checks against a minor's account. The main object borne in mind was to be satisfied that the minor received benefit from an expenditure of his funds. The importance of this point of view was brought to the minds of the superintendents by a circular letter issued on October 23, 1911.

2. *Adult Indians able to do a day's work.*—During the past year the office has made a renewed effort to allow the Indians in this class their funds in sufficient amounts without restriction, where a satisfactory showing of competency was made, in order to give them practical experience. On the Colville Reservation alone, out of disbursements for the fiscal year 1912, amounting to approximately $350,000, over $100,000 in amounts large enough to give them actual experience was authorized to be paid unrestricted. The amount so authorized did not include regular monthly payments. The superintendent reports that of the amount allowed the Indians for their unrestricted use probably 50 per cent was used in the improvement of their lands; 25 per cent was probably used for subsistence, and the remainder was so expended as to yield little or no return.

Funds belonging to able-bodied Indians manifestly incompetent were expended, so far as possible, in making permanent improvements upon their allotments and in the purchase of horses and implements, under the supervision of a local field officer. On the Rosebud Reservation during the past fiscal year, out of an expenditure of individual Indian funds exceeding a half million of dollars, more than $180,000 was authorized for the purchase of horses and the construction of buildings. The amount so authorized does not include such articles as household furniture, harness, and farming implements, digging of wells, etc., which represent a large figure of the disbursements. The superintendent of Omaha and Winnebago

Agencies stated in his letter of May 25, 1912, that then there were over a dozen full sets of farm buildings under construction on those reservations; that at least a dozen more would be started shortly thereafter, and that probably 30 Indians had planned to sell land and use the proceeds for the same purpose. The improvements constructed on the Omaha and Winnebago Reservations were supervised by the superintendent. On June 13, 1912, the superintendent of Yankton Indian School addressed a letter to this office concerning individual Indian money, in which he said:

> To show that the office here has done what it could to assist these people in the way of funds, there has been paid out during the four months of my incumbency the following amounts:
>
> For seed wheat, $1,713.13; corn, $561.55; oats, $337.55; potatoes, $764.87; garden seed, $45.50; horses, $6,202.78; wagons, etc., $1,347.43; farming machinery, $1,769.17; making a total of $12,741.96. There has also been paid out to these people during the four months that I have been here the following: For February, $9,890.56; March, $12,020.15; April, $8,980.66; May, $13,032.45; total, $43,923.82. In addition to these amounts there was paid out during this time the sum of $12,000 in interest money, and the competent Indians who draw their lease money outside the office have probably received $10,000 more, making a grand total of money expended on these people that they did not earn of $78,670.78, or about $46 per capita. Thus it will be seen that there has been no lack of money drawn by these people during the past four months, and I doubt very much if any more money could have been spent on them profitably.

3. *Old Indians.*—So far as Indians of this class have had means, their money has been authorized freely for such purposes as would keep them well and happy. The superintendent of Fort Lapwai Indian School on February 14, 1912, reported that there were at that time 1,440 Indians under his jurisdiction who had on deposit to their credit $105,979.48. During the month of January, 1912, 196 of these Indians drew monthly allowances, and 695 of the older people were being permitted to draw their rent money direct when due. During the fiscal year probably $20,000 was paid in the form of monthly allowances to about 200 Indians of the Colville Reservation.

A long and forward step has been taken during the past year in regard to the use of individual Indian money for the promotion of farming operations. In approving each individual sale of allotted or inherited land, the Secretary, in an order over his signature, directed the expenditure of the proceeds in whole or in part. Almost invariably a part of the proceeds were authorized by him for the improvement of the grantor's remaining land. If the vendor was an old Indian and lived in a sanitary house he was in most cases provided with a monthly payment. This method precluded all possibility of the proceeds of sale being diverted to other uses than for the purposes and needs which were advanced as a justification for the sale of the allottee's land.

Efforts to promote honor and integrity during the past year were made by various means in many individual cases. As the keynote of Indian progress has been individualism, perhaps the most effective general action taken during the fiscal year was the sending of a personal letter to each superintendent handling individual Indian funds in order to impress upon his mind a most important consideration—that the funds of an able-bodied Indian should be handled in such a way as not to weaken his moral stamina as a man.

DEPOSITARIES FOR INDIVIDUAL INDIAN MONEYS.

It has been the custom to place in national banks, regularly designated and bonded for the purpose, individual Indian moneys derived from the sale of inherited lands and timber on allotments of individual Indians, from the leasing of lands, or from other sources. An act of Congress approved June 25, 1908 (36 Stat. L., 855, 856), provided for the selection, as depositaries for this class of funds, of either National or State banks in the discretion of the Secretary of the Interior; but until recently the deposits were confined to national banks because these institutions are under the supervision of the Government. On several occasions, however, the question of using State banks as depositaries was taken under advisement, and early in 1912 a plan for the investigation of such institutions was formulated by the department in connection with deposits of moneys derived from the sale of surplus and unallotted lands and other property belonging to the Five Civilized Tribes under the act of Congress approved March 3, 1911 (36 Stat. L., 1058, 1070), with the result that by June 30, 1912, the applications for deposits of 42 State banks had been approved.

Following the course pursued regarding those tribal funds, steps were taken looking toward the use of State banks as depositaries elsewhere in the service. A plan for investigating the State banking institutions of South Dakota was next developed by the department, and a number of banks have applied for deposits. Plans applicable to banks in other States are being formulated, and in cases where convenience to the Indian depositors, the rates of interest offered, and the investigation of conditions warrant, deposits of Indian funds will be made in State institutions.

One advantage which seems certain to result from this departure from the old practice is that there will become available for selection a larger number of depositaries located in or adjacent to the Indian communities, thus making it easier to inculcate practical and valuable business lessons, and at the same time lifting the Indians, at least from a commercial standpoint, in the estimation of the white citizens; in other words, their condition will more nearly approximate that of their thrifty white neighbors.

Although the office has, as a rule, been able to procure a good rate of interest on these Indian funds, while protecting them against loss by requiring surety bonds from the banks, it is hoped that the acceptance of State banks as depositaries will bring still better earnings.

EMPLOYEES IN THE FIELD.

An important change pertaining to the method of appointing superintendents was effected during the year. Heretofore these officers have been drawn from the lower grades in the Indian service by promotion—in a few instances by transfer from other branches of the service—there being no provision for appointing persons to this position who were not already in the classified service. Superintendents being usually selected from chief clerks, principal teachers, and farmers who by reason of their long experience and fitness for their special lines of work had high efficiency ratings, promotions were practically limited to seniority. The appointment of an em-

ployee whose efficiency record showed him to stand high in his special line of work was in the nature of an experiment, as his ability outside of his specialty could not be definitely determined. This was the greatest weakness of the system, and the need of a broader field from which to draw material was apparent. Consequently arrangements were made with the Civil Service Commission for holding an examination or test, with a view of establishing an eligible list of persons from which to make selections. This test was designed to ascertain the business and executive ability of the competitor, as well as his qualifications as a practical sociologist in meeting human problems.

This change in policy has demonstrated conclusively that there are men now in the service who are excellent material for promotion to a superintendency, but whose qualifications for the position probably would never have been brought out under the former system. It has also shown that there are many men outside of the service who could command much larger salaries in the business world than the office can pay under existing appropriations, but who are willing to sacrifice material compensation because of their deep interest in the Indian work.

The test may be taken at any time and place, the papers being rated from time to time, and a new register of eligibles established quarterly. In the effort to procure the very best possible material for appointment as superintendents, the office has had the hearty cooperation of the Civil Service Commission.

Another step affecting the personnel was the matter of placing within the classified service all persons paid from tribal funds. For many years no distinction was made by this office or by the Civil Service Commission between the positions paid from such funds and those paid from congressional appropriations. But a year or so ago the Civil Service Commission issued a ruling that employees paid from tribal funds were not within the classified service. About 1,000, or one-sixth, of the employees were affected by this ruling, and as it is frequently necessary to change from one fund to another in the payment of salaries, eventually a larger number would have lost their classified status. Therefore, this ruling, if adhered to, would have had a demoralizing effect upon the personnel, as few persons would care to remain in a service where the tenure was so uncertain; nor could competent persons be procured to take their places. Therefore, the commission was requested to reconsider the matter, and, after being placed in possession of all the facts, reversed its former ruling.

The difficulty experienced in the past in procuring and retaining a competent corps of employees has not lessened, and it has been necessary at times to carry a large temporary force. This condition is due to the large percentage of civil-service eligibles who decline appointment and to the comparatively short period those appointed remain in the service. During the fiscal year 1911 but 53 per cent of the eligibles certified by the Civil Service Commission were willing to accept positions, and this percentage dropped to 51 during 1912. Approximately 23 per cent of the present force has been in the service one year or less; 15 per cent, two years; 11 per cent, three years; 10 per cent, four years; and 6 per cent, five years, making about 65 per cent of the field force that has been in the service less than five years.

Aside from the large number of changes occurring by resignation it became necessary to make about 600 transfers within the service in order to give deserving employees slight increases in salary.

* * * * * * *

In conclusion, I can report that the Indian service in all its parts has again shown an increased activity over the preceding year, not in extension of jurisdiction, but in grappling more deeply and more intimately with the problems it has to solve. As I have said before, I believe the increased volume of business is transitory, leading to an early climax and denoting real progress toward the day when the United States will finally have lifted its hands from Indian affairs, and all Indians in all respects will stand on an equal footing with their fellow Americans.

ROBERT G. VALENTINE,
Commissioner.

The SECRETARY OF THE INTERIOR.

REPORT

OF THE

SECRETARY OF AGRICULTURE.

Mr. PRESIDENT:

I respectfully present my Sixteenth Annual Report, covering the work of the Department of Agriculture for the year 1912.

BRIEF COMMENTS.

The most effective move toward reduced cost of living is the production of greater crops. This is attributable to the work of the Department of Agriculture, the agricultural colleges and experiment stations, and the help of the press in publishing every movement to help the farmers. Demonstration work in Southern States in the fields has been of immediate benefit. The South has increased the food supply very much in the last few years. The movement ordered by Congress to take farm demonstration into all Northern States will bring more food into our markets. Our fields can and will steadily increase their output in coming years as ways and means of growing heavier crops become better understood. The Nation forgot its farmers in the general scheme of education of past years; few philanthropists thought of them when giving for education. Congress is good to them. They are waking up and thinking for themselves.

The crop of sugar from the beet was 600,000 tons a year ago; it is 700,000 tons this year. The sugar comes from the carbon-dioxide of the atmosphere, taking no valuable plant food from the soil. The process of growing is intensive agriculture, something new to all but our gardeners, and prepares the soil for increased yields of all other crops.

One hundred and sixty-four thousand square miles have been cleared of the fever tick in the Southern States, equal to the area of three States. The farmers there are bringing in improved stock and will soon contribute materially to the meat supply.

Seven hundred acres of Egyptian and other long-staple cotton are being grown on the Colorado River in southern California, under research conditions that give good promise of eventually supplying the demand for such fibers. Thread makers of Europe are here inquiring into future supplies of long-staple cotton. The market waits for the scientist to do his work.

When the Panama Canal is open for business our bulbs and beet seed will come from the Pacific coast.

The leading specialists of the Department of Agriculture educate their assistants. The outside world wants them and pays more than the law permits being paid in the Government service.

The food and drugs act is exacting on department time; 1,459 violations were sent to the Department of Justice during the last year—25 per cent more than in the year before. Jail sentences are now being imposed.

Our farmers get only half crops on the average, or 10 tons of beets from an acre. They are learning how to farm intensively and will grow twice this tonnage in a few years, when they will not fear reduction of duties.

Our dry-land problems will be measurably solved through alfalfas from Siberia and nonsaccharine sorghums from Africa.

Congress has given us law to keep out diseased and insect-infested plants.

Farm demonstration in the fields is being organized in all the Northern States, Congress providing.

The field is the best classroom for instruction in practical agriculture.

Department study of poultry and eggs will help to get these foods to market in good condition.

The sea is the great reservoir of potash. The kelp plant gathers it. We gather the kelp and extract.

Two feet of woven wire and three barb wires keep dogs out of a sheep pasture. Dogs outnumber sheep in many States, and we have not learned to eat dogs as they do in some European countries. The reason given by most farmers why they do not keep sheep is "the dogs." Kansas had, in 1910, 175,000 sheep and 199,000 dogs, Coburn tells us.

The town does not need the retired farmer, while the farm needs his experience and his capital. A retired farmer is capital going to waste.

Taking care of the soil is the first consideration in the conservation of our resources.

Denmark buys our mill feeds and sells $40,000,000 of dairy products to Great Britain.

Bookkeeping will soon be as common on the farm as in the factory. It is just as important for a farmer to know what it has cost to produce a given crop as for the manufacturer to know the cost of making the article he sells.

CROP RESULTS.

MOST PRODUCTIVE OF ALL YEARS.

EARTH'S GREATEST DIVIDEND.

Most productive of all agricultural years in this country has been 1912. The earth has produced its greatest annual dividend. The sun and the rain and the fertility of the soil heeded not the human controversies, but kept on working in cooperation with the farmers' efforts to utilize them. The reward is a high general level of production. The man behind the plow has filled the Nation's larder, crammed the storehouses, and will send liberal supplies to foreign countries.

The prices at the farm are generally profitable, and will continue the prosperity that farmers have enjoyed in recent years. In spite of the lower total value of animals sold and slaughtered, the total crop value is so far above that of 1911, and of any preceding year, that the total production of farm wealth is the highest yet reached by half a billion dollars.

Based on the census items of wealth production on farms, the grand total for 1912 is estimated to be $9,532,000,000. This unthinkable amount of wealth has been contributed to the Nation in one year by the soil and by the farmers' live stock. It is more than twice the value of the wealth produced on farms in 1899, according to the census, and it is about one-eighth more than the wealth produced in 1909.

During the last 16 years the farmer has steadily increased his wealth production year by year, with the exception of 1911, when the value declined from that of the preceding year. If the wealth

produced on farms in 1899 be regarded as 100, the wealth produced 16 years ago, or in 1897, is represented by 84, and the wealth produced in 1912 by 202.1. During the 16 years the farmers' wealth production increased 141 per cent.

The array of figures that expresses the farmers' contribution to national wealth production testifies to the farmers' basic importance to the Nation. During the last 16 years the wealth production on farms, according to the census items, reached the grand total of more than $105,000,000,000. This stream of wealth has poured out of the farmers' horn of plenty, and in 16 years has equaled about three-quarters of the present national wealth.

CHIEF CROPS.

In the statement that follows concerning the crop quantities and values for 1912 no figures should be accepted as anticipating the final estimates of this department to be made later. Only approximations can be adopted, such as could be made by any competent person outside of this department. All values are for products at the farm unless otherwise stated, and in no item are values at the produce or commercial exchange.

CORN.

A cornfield half as large again as Italy, or nearly as large as either France or Germany, is the area of this country's cornfield. The largest crop of corn ever produced in this country was that of 1912. It reached the staggering amount of 3,169,000,000 bushels, or considerably more than the record crop of 1906, and much above the average crop of the preceding five years. For reasons which are perhaps economic, or perhaps due to custom, the United States raises three-quarters of the world's crop of corn. As a corn-producing country Austria-Hungary stands next to the United States, with a maximum production of over 200,000,000 bushels, and Argentina, standing third, has a maximum production of a little less than that amount.

The value, too, of the corn crop of this year is the highest on record. The most valuable previous crop was that of 1908, but the value of this year's crop much exceeded it and reaches the fabulous amount of $1,759,000,000. Well did the poet sing, "No richer gift has Autumn poured from out her lavish horn!" The corn crop of this year is worth to the farmer 20 per cent more than the average corn crop of the previous five years.

HAY.

Hay has returned to its old place and is the crop that is second in value. It held this place for many years until in recent times,

when it gave place to wheat and then to cotton, but this year cotton is apparently below hay in value. It was a most productive year for grass and hay, and the harvest of hay is measured by 72,425,000 tons. No previous year has equaled this quantity; it is 16 per cent above the average crop of the preceding five years.

The value of the hay crop this year, $861,000,000, has not been equaled. It is immensely more valuable than the crop of 1910, which had held the record. The average value of the hay crops of the preceding five years is exceeded by the value of this year's crop by 21 per cent. The importance of this crop to the farmer is better realized when it is observed that its value is greater than that of the cotton crop and nearly as great as the combined values of the wheat, tobacco, and potato crops.

COTTON.

It is too early to estimate the production of cotton this year, but there is a general agreement throughout the country that the crop will be the second one, considerably below the great crop of 1911 and somewhat above the next highest crop, which was raised in 1904. If the lint produced equals the general expectation, it will weigh about one-eighth more than the average crop of the preceding five years.

In value, as well as in production, the cotton crop of this year stands second. While the production of 1911 was greater, the value of that crop was not correspondingly large, and was exceeded by the much larger value of the much smaller crop of 1910. The crop of 1910 had 11,609,000 bales of 500 pounds and was worth to the producer $788,000,000; the crop of 1911 had 15,693,000 bales and was worth only $661,000,000. The lint crop of 1912 may be worth $735,000,000.

Cotton often demonstrates the frequently observed fact that a crop of excessively high production may not be worth as much in the aggregate as one that is about sufficient for the requirements of consumption. It is a matter of great importance to the farmer that he should not overproduce. Not that he objects to the presence of an abundance of products for their own sake, but that he foresees unprofitable prices. Farmers, in their collective action, endeavor to produce about the quantity of a crop that they can market at profitable prices. An experience of years gives them a rough sort of judgment with regard to this quantity, but they can not foresee what the weather will do to their crops. Having made their planting and sowing plans, it may be assumed, with fairness to themselves and also to consumers, the crop suffers under unforeseen adversities, there is inadequate production, and the general conclusion is that the agriculture of the country is unable to meet national requirements. This

conclusion, however, is soon forgotten, and, as a prominent live-stock paper has recently stated, "given three years of real farm plenty and prophets of dwindling food supplies in comparison with population will take down their signs."

To the value of the cotton lint must be added the value of the seed, which in recent years has grown to a very large figure. Not so very many years ago cotton seed was a nuisance to the planter and was worse than worthless. It has now become worth more than $100,000,000. The seed from the crop of this year is estimated to be worth about $117,000,000, or 6.3 per cent more than the average value of the preceding five crops, but it does not equal the value of the seed of the crops of 1909, 1910, and 1911, although it exceeds all other years. Cotton lint and seed should be combined in stating the value of the cotton crop. Together they are worth about $860,000,000, or about half the value of the corn crop and a little less than the value of the hay crop. In value as well as in production the cotton crop of this year has been exceeded by only one year, and that was by 1911 for production and by 1910 for value.

WHEAT.

The wheat crop has lost ground in relative importance of value in recent years. The crop of this year is estimated to be worth to the farmer $596,000,000, an amount which was exceeded by the value of the crops of 1909 and 1908, but no other year. However, it is nearly 2 per cent more valuable than the average crop of the previous five years.

The quantity of the crop, on the other hand, makes a much more favorable comparison with the average production of the previous five years, since it is 11.2 per cent greater. The wheat production of this year amounts to 720,333,000 bushels, a quantity that was exceeded by the 748,460,000 bushels of 1901 and the 735,261,000 bushels of 1906. The crop of this year is third in size and was only 15,000,000 bushels below the next higher crop and only 28,000,000 bushels below the highest production that this country has had. This is a sort of double crop, inasmuch as it is subdivided into spring and winter crops, and had the winter crop of this year done as well as the spring crop did the total of the two might have made a new record.

OATS.

Fifth in order of value is the oats crop. The production this year was extraordinary. It reached an amount 46 per cent above the largest crop previously produced, that of 1909. The season was remarkably favorable to oats, especially in the greater producing States. The crop of 1912 was 1,417,172,000 bushels, or 51.5 per cent greater than the average of the preceding five years.

The price of oats has necessarily declined in consequence of such enormous production, and yet, contrary to the result that has been observed in the case of cotton, the aggregate value of the oats crop this year has not been equaled; indeed, this value is 22.2 per cent above the average of the preceding five years, and amounts to $478,000,000. This is a value within $118,000,000 of the worth of the wheat crop and is a little more than half of the value of the entire cotton crop.

POTATOES.

Sixth in order of value is the potato crop. Its amount is $190,000,000, a low amount for this crop in recent years. The crop of three former years exceeded that of this year in value, and the average value of the crops of the five preceding years was higher by about 3 per cent.

The production of this crop, on the other hand, is higher than has heretofore been reached, and amounted to 414,289,000 bushels, or about 29 per cent above the five-year average. In consequence of the high production of this year, the price of potatoes has fallen to a low figure in some regions. This crop seems to be one of those that are worth less in the aggregate when the production is very high than they are worth when the production is low. The potato crop of 1911, it will be remembered, was deficient and large imports were brought into the country to supply the temporary deficiency, yet the short crop of 1911 was worth $234,000,000, or $44,000,000 more than the abundant crop of this year is worth.

BARLEY.

With a production of 224,619,000 bushels the barley crop of this year far exceeds the largest one heretofore produced. It is an extraordinary production for this country, and exceeds the average crop of the five preceding years by 35.7 per cent. This is a crop that has increased very much during the last 20 years, and even during the last 10 years. Perhaps, in consequence of the extremely high production, the price of barley has declined so as to make the value of the entire crop below that of the record year. This year's crop is valued at $125,000,000, while the crop of 1911 had a value of $139,000,000, although its production was 64,000,000 bushels less. Still, the value of this year's crop is 18.5 per cent above the five-year average.

TOBACCO.

The tobacco crop has not quite risen to the high level of production of most of the other crops, since it has been exceeded by the crops of two former years. The production, however, of 1912 is 959,437,000 pounds, and is 7.1 per cent above the average of the preceding five

years. The price of tobacco has risen somewhat, so that the total value of the crop is about 11 per cent above the five-year average. The value of the crop has gained more than the production. The value has not been determined, but apparently it is about $97,000,000, an amount that has been twice exceeded.

FLAXSEED.

Among the smaller crops flaxseed is the most valuable one, the amount for this year being about $39,000,000, or 32.4 per cent above the average value of the five preceding crops. This gain is partly due to extraordinary crop failure in 1910. The production of 1912 has never been equaled and is 44.1 per cent above the five-year average. Its quantity is 29,755,000 bushels.

RYE.

Rye is one of the crops that remain nearly stationary in production and vary little from year to year. The crop of 1912 contained 35,422,000 bushels and is the largest that has been produced by a small margin. It is 10 per cent above the five-year average. The total value of this crop, $24,000,000, has not gained in equal degree, since it increased only 2.3 per cent over the five-year average; and while the production was highest, the total value was exceeded by that of two other crops, those of 1910 and 1911.

RICE.

Although the production of the rice crop can not now be announced, the indications are that it has been exceeded by the production of only one year, and that it is about 8 to 10 per cent above the average production. This crop was damaged by the extraordinary freshet of the Mississippi River last spring, or else the production would, perhaps, have been a record one. The value of this crop is unusually high and is far from being equaled by that of the crop of any former year. It may amount to upward of $20,000,000.

BUCKWHEAT.

A decided tendency to increase in production has been manifested in this crop in recent years. The production of 1912 is the largest since 1868 and is 19.3 per cent above the five-year average. The production is small, as crops go in this country, and amounted to only 19,124,000 bushels in 1912, but the demand for this cereal is increasing and there are practically no exports. The value of the crop of this year is over $12,000,000 and exceeds the five-year average by about 11 per cent. It has been exceeded since 1869 only in one year.

HOPS.

Extraordinary conditions of the world's hop market in 1911 on account of deficient European production have not been repeated this year, and consequently this crop finds a much more normal situation. The production of 1912 is estimated to have been 44,500,000 pounds, or about 1 per cent below the 5-year average, but the total value of the crop is 38.3 per cent above the average and amounts to about $11,000,000.

ALL CEREALS.

All of the cereals except wheat and rice produced their largest crops in 1912, and consequently the total production of this class of crops is far above the average. The gain is 25.6 per cent above the 5-year average. The total production of the seven cereals amounts to 5,609,807,000 bushels, a bulk of food so large as to be entirely beyond understanding. The largest total of any preceding year was 4,958,559,000 bushels in 1910.

The combined value of this great mass of products is a little over $3,000,000,000, and is 15.8 per cent above the average of the previous five years. In no previous year has the value of the cereals exceeded $2,760,000,000, the figures for 1908.

SUGAR.

Sugar is a product of manufacture from the farmers' sugar beets and sugar cane. The farm products can best be treated from the point of view of the manufactured sugar and the by-products.

Beet sugar is a comparatively recent product in this country. The raising of sugar beets for sugar making can hardly be regarded as being an established industry 16 years ago. Beginnings had been made, but the success of the industry was not assured. Under the encouragement of the law, this department and other agencies promoted the growth of this industry, and the industry grew year by year and it became more firmly established.

The latest fruition of all these efforts appears in the magnificent testimonial of the production of 1912. The production of this sugar in 1899, as ascertained by the census, was 81,729 short tons. It increased to 218,406 tons in 1902, to 312,921 tons in 1905, to 501,682 tons, according to the census, in 1909, and to 599,500 tons in 1911. The production of 1912 amounts to about 700,000 short tons, or a gain of about 100,000 tons over the preceding year.

The beet-sugar production of 1912 is about one-fifth of the national consumption of sugar and illustrates what can be done under the protection of the law and in consequence of practical and well-directed efforts.

Beets yield from 10 to 13 tons per acre, and the grower receives from $50 to $70 or more per acre for a crop that leaves his land in better condition after harvest than before. Moreover, the market for the beets is found before the crop is planted. Beet factories furnish in pulp a serviceable stock feed. The growth of this industry and the plans for its increase indicate that beet raising for sugar purposes is much desired by farmers for profit and cultural benefit to the land.

If the by-products of the beet-sugar manufacture are combined with the factory value of the sugar, the total value of the products of the beet-sugar industry in 1912 is found to be about $67,000,000.

The cane-sugar industry fared badly this year on account of the Mississippi River flood. The production of sugar is the lowest since 1899, and the value of the products of the industry, including molasses and sirup, is only about $34,000,000.

The sorghum sirup and maple sugar and sirup industries of the farm produce a value of about $15,000,000 a year, and the total of this amount and of the value of the products of the beet-sugar and cane-sugar industries is about $117,000,000 for 1912. This is a reduction of about $20,000,000 below the combined values of these industries for 1911, but the loss of the cane-sugar industry in 1912 as compared with 1911 is much more than this amount, so that had it not been for the Mississippi flood the value of the products of these industries would have been higher than in 1911, and the amount for that year was the highest reached.

SUMMARY OF COMPARISONS.

The year 1912 was a record breaking one for crop production and crop values. Only two crops had been exceeded twice in production, and these are wheat and tobacco. The high production of buckwheat half a century ago is ignored. Only two crops had been exceeded once in production, and these are cotton and rice. All of the other crops stand at high-water mark—all of the cereals but wheat and rice, the great hay crop, potatoes, flaxseed, and beet sugar.

With respect to value, the only crops that have been exceeded three times are potatoes and cotton seed; the crops exceeded twice in value are wheat, cotton seed, tobacco, and rye; and the crops that have been exceeded once in value are cotton lint, beet sugar, and buckwheat (since 1869). All other crops reached their highest value in 1912, and these included all of the cereals except wheat and rye, the prominent hay crop, flaxseed, and beet-sugar by-products.

INCREASE OVER 1911.

The year 1911 was one of low production, 1912 of high production. The contrast clearly appears when expressed in percentages of in-

creased production. The corn crop of 1912 increased 25.2 per cent above that of 1911; the wheat crop, 15.9 per cent; the oats crop, 53.7 per cent; barley, 40.2 per cent. All of the cereals increased, and the average for them is 30.2 per cent, which expresses the gain of 1912 over 1911 in quantity of production for the cereals. The gain in value was much less, or only 10.8 per cent. Among the gains of other crops in quantity appear 52.7 per cent for hay, 41.5 per cent for potatoes, 53.6 per cent for flaxseed, 16.8 per cent for beet sugar. The only crops for which value increased at least in the degree of increase of production, are rice, sugar beets, and tobacco, while in the case of cotton the production decreased and the value increased.

LIVE-STOCK PRODUCTS.

DAIRY AND POULTRY PRODUCTS.

The dairy cow is one of the principal producers of wealth on the farm, although not prominent in public notice. The farm value of the dairy products of 1912 is estimated at about $830,000,000, an amount which exceeds the value of the cotton lint and is nearly equal to the combined value of lint and seed. The products of the dairy cow are worth nearly as much as the value of the hay crop and are nearly twice the value of the oats crop. The wheat crop is worth only three-quarters as much.

Poultry is another industry of great wealth production on the farm. Here is an illustration of how large an aggregate of an immense number of little things can become. An egg may be worth only a cent and three-quarters, and yet 1,700,000,000 dozen eggs are worth $350,000,000, and these are the estimates for 1912.

If to the value mentioned is added the value of the fowls raised, the products of the poultry industry on farms amounts to about $570,000,000. This is nearly equal to the value of the wheat crop and exceeds the value of the oats crop. It is more than three-quarters of the value of the cotton lint produced this year. The value of poultry products in 1912 has been exceeded in two former years.

Wool production has apparently been exceeded in two former years, yet in 1912 it amounted to 318,548,000 pounds. This wool had a farm value of about $55,500,000, or about 6 per cent below the average value of the wool clip of the five preceding years.

The animals sold from the farm and the animals slaughtered on it together numbered about 111,000,000 for 1912, and the farm value of these animals is estimated to be $1,930,000,000. This is the highest value of animals sold and slaughtered since about 1900, except in 1909 and 1911.

VALUE OF ALL ANIMAL PRODUCTS.

The total value of the animal products of the farm in 1912 is estimated to be about $3,395,000,000. This is a larger value than that of

1911, but is about $150,000,000 below the estimate for 1910, which is the only year that exceeds 1912 in value of animal products produced on the farm.

While the animal products are about one-third of the value of the wealth production of the farm in 1912, the crops are about two-thirds. Their value in 1912 is $6,137,000,000, an amount which is vastly above the high-water mark of total crop value in 1911.

Such are some of the details with which the grand aggregate of $9,532,000,000 has been built to represent the farm value of the wealth created on the farms of this country in 1912. This industry of agriculture has grown to be so great that in discussing such features as these hundreds of millions and billions are common coins of expression.

PRICES OF FARM PRODUCTS.

COMPARISON WITH RECENT YEARS.

CHANGES SINCE 1911.

Farm prices at which the crops of 1912 are valued declined from the prices of 1911 in the cases of some important products. The barley crop has declined about 36 per cent in price per bushel; the corn crop about 10 per cent; the oats crop about 25 per cent; the rye crop about 17 per cent; and the wheat crop about 5½ per cent. The large crop of hay caused a decline of about 19 per cent in price per ton, and the extraordinarily large potato crop suffers a decline of about 43 per cent from the price of 1911. For a reason already stated, there is cause for the decline of about 42 per cent in the price of the hop crop per pound. The flaxseed crop has declined about 27 per cent in price, beet-sugar and cane-sugar crops about 22 per cent.

The price of the cotton crop of 1912 has gained about 25 per cent over that of the crop of 1911, and the price of the seed has gained nearly 5 per cent. The gain of price for the rice crop is nearly 13 per cent, for the tobacco crop about 7½ per cent, and for the wool clip nearly 7 per cent.

Among the dairy products the price of the year's product of butter has increased about 11 per cent over that of 1911, and the price of milk nearly 5 per cent. A decline of nearly 1 per cent is found in the price of the year's production of poultry, and a gain of nearly 16 per cent in the price of the year's production of eggs.

COMPARISON WITH AVERAGE OF FIVE YEARS.

When the price adopted for the crop of 1912 is compared with the mean of the preceding five years, decreases are noticed all along the line. The decrease for corn is 1.4 per cent; for wheat, 9.1 per cent;

for oats, 20.4 per cent; for barley, 13.7 per cent. For cottonseed the decline is 11.3 per cent, and for cotton lint 1.8 per cent; flaxseed, 15.1 per cent; potatoes, 29.1 per cent; wool, 9.8 per cent.

On the other hand, increases of crop prices of 1912 compared with the preceding five years are found in some instances. For rough rice the increase is about 14 per cent; for hay, 2.1 per cent; for tobacco, 2 per cent; for hops, 26.3 per cent; for eggs, 8.5 per cent.

PRESENT RESTORATION OF FORMER PRICE LEVELS.

Prices of farm products for December 1 have been collected by the Bureau of Statistics for many years. If mean prices are computed for decades, a series of price levels can be established and the trend of prices can be better observed. In the case of wheat, for instance, the mean price, December 1, for the United States at the farm was 115.5 cents from 1866 to 1870; it was 99.5 cents from 1871 to 1880; 82.2 cents in the next decade; and 63.2 cents in the decade of lowest prices, 1891 to 1900; afterwards the increase was to 79.6 cents in the decade of 1901 to 1910; and the farm price for 1912 is nearly 83 cents, or about at the level of the decade 1881 to 1890 and considerably below the level of the preceding groups of years back to 1866.

A similar treatment of cotton prices shows that the mean price of cotton in 1868 and 1869 was 14.3 cents; in the following decade it was 12.1 cents, after which it declined, until in the decade of extremely low prices, 1891 to 1900, the price is only 6.9 cents. In the following decade cotton rose to 10.8 cents; and in 1912 it is worth at the farm about 11 cents.

In the case of corn there was a decline on the whole from 52.1 cents as the mean of 1866 to 1870 to 33 cents for 1891 to 1900, followed by the mean price of 48.8 cents in the decade 1901 to 1910 and the price of about 55.5 cents for 1912.

The decline of mean prices of oats was from 39.7 cents in 1866 to 1870 to 26.1 cents in 1891 to 1900, with a recovery to 36.3 cents in 1901 to 1910, and the present price is about 33.7 cents, or substantially a restoration of the price level of the two decades extending from 1871 to 1890.

The price record for potatoes discloses the extremely low position of the price of this year's crop. The mean price for 1866 to 1870 was 56.1 cents, from which there was a decline on the whole to 44.8 cents from 1891 to 1900. The next decade had a price of 58.6 cents, and the price for 1912 is about 45.8 cents, or close to the level of the lowest price period of many years, which was from 1891 to 1900.

The foregoing extracts from price records of the Bureau of Statistics are indicative of the general downward movement of the prices of farm products from the Civil War until it was arrested in about the middle of the decade extending from 1891 to 1900. The subse-

quent elevation of prices has sometimes carried them to about the level of the earlier years under review, and sometimes higher, but it may be noticed that if comparison is made between present prices and the extremely and abnormally low prices of the nineties the present period of high prices is made by force of the comparison to occupy a relatively higher place than it does if comparison is made with the higher-price periods preceding.

FOREIGN TRADE IN AGRICULTURAL PRODUCTS.

ANALYSIS OF EXPORTS.

HIGH VALUE OF NATIONAL SURPLUS.

Over a billion dollars is, for the fourth time, the value of the exports of farm products. It is sufficient to pay the expenses of the National Government. As long ago as 1878 the value of agricultural exports reached half a billion dollars; by 1892 the amount had touched $800,000,000; and by 1901 it had grown to $950,000,000. The billion-dollar mark was reached in 1907, when the value of agricultural exports amounted to $1,054,000,000. That amount has not since been equaled, but the exports of 1908 and 1911 exceeded a billion dollars in value, and in 1912 the amount fell short of the record exports by only $4,000,000.

RISING QUANTITY OF EXPORTS.

The high value is not entirely due to high prices. The trend of the quantity of the exports of particular commodities can best be understood by using index numbers. Let the quantities of the average yearly exports of the 10 years 1900 to 1909 be represented by 100 and convert the quantities of the exports of other groups of years and of individual years into terms related to that basis. It will then appear that the exports of oleo oil have increased year by year after the period of 1900 to 1909 to the relative amount of 112.3 in 1912. This commodity was exported this year to the value of $13,000,000.

Lard compounds also have increased above the average of the period 1900 to 1909, the relative number for 1912 being 114.8. The exports of this commodity are this year as high as $5,000,000. Various animal oils, not specifically described, have increased in exports during the last three years. Another commodity that is increasing in exports is eggs, which have arisen to the relative number 359.8 in comparison with 100 as representing the 10 years 1900 to 1909. In 1912 the value of these exports amounted to $3,400,000. The exports of mutton amount to only a few hundred thousand

dollars in value, but they are increasing, and the relative number for 1912 is 283.1 in comparison with 1900 to 1909.

The exports of cured pork hams declined in 1910 and 1911 to about three-quarters of the average from 1900 to 1909, but in 1912 the exports were very nearly restored to the former amount. Lard is another commodity that has been climbing back to former importance as an exported commodity, and the quantity exported in 1912 is indicated by 88.8. If the exports of pork and of all of its products are consolidated, it will appear that they are rapidly returning to the average exports of 1900 and 1909.

Cotton is the great mainstay of the export trade. Marked increase in exports is conspicuous. Compared with the average exports of 1900 to 1909 represented by 100, the exports of 1890 to 1899 were 79.7; the exports of 1910 were 85.7; in 1911 they were 107.8; and in 1912 the relative number is 147.9.

Apples are supporting an increased export trade, which now amounts to about $10,000,000. The export trade in dried apples is steadily increasing, and in comparison with the average of 1900 to 1909, the exports of 1912 are represented by 159. For fresh apples the exports of 1912 are represented by 124.1. Prunes are a fruit that has reversed the tide of international trade. Its exports now amount to several million dollars a year, and are increasing. During the last three years the exports of this fruit were nearly double the average of the period 1900 to 1909. Raisins have done better yet, and now amount to about four times the average exports of the period mentioned. Their value is more than a million dollars. Glucose and grape sugar, with exports amounting to several million dollars a year, are contributing to the foreign trade annual quantities above the average of the 10-year period mentioned.

To the list of commodities whose exports are increasing and are above the average of the 10 years, 1900 to 1909, or very close to that average, may be added hops, corn-oil cake, cotton-seed oil cake and oil-cake meal, flaxseed oil cake and oil-cake meal, cotton-seed oil, linseed oil, rice, cotton seed, tobacco; and the four vegetables, beans, pease, onions, and potatoes.

The foregoing would be quite a respectable list even though cotton were omitted. Beef and its products have gone into a sorry decline in the export trade, but wheat flour still maintains a high relative showing, as is indicated by 71.2 in comparison with the annual average of the 10 years, 1900 to 1909, and has steadily increased in exports during the last three years. The exports of wheat, including flour converted to wheat, amounted to 80,000,000 bushels in 1912.

The general fact, however, is that the packing-house products have declined in value of exports since 1906, when they reached their

highest value, $208,000,000, and have declined still more in quantity because of the increasing prices, yet the value of packing-house exports has increased since 1910 and reached the amount of $164,000,000 in 1912. So with grain and grain products, the quantity in the aggregate is diminishing as well as the value, and the high export values of five and six years ago have not since been equaled. In 1912 the export group known as grain and grain products had a value of $123,000,000.

IMPORTS.

Agricultural imports are steadily increasing in value, subject to some fluctuations. They reached their highest value in 1912, when they amounted to $784,000,000. This was an increase of about $100,000,000 over 1911 and 1910, the years of highest import values preceding 1912. Notable increases are found in the imports of coffee, sugar and molasses, tobacco, wool, and packing-house products, in which hides and skins are very prominent.

LARGE BALANCE OF TRADE MAINTAINED.

It is apparent that since 1908 the balance in the foreign trade in agricultural products has not kept up to its former figure, but, as has already been said, this is not because of diminished export values, but is due to a greater increase of imports than exports. Notwithstanding this, the balance in favor of exports of farm products was as high as $278,000,000 in 1912, and this was higher than the amount for 1910 and also for 1909.

At no time before 1912 have farm products been hard pushed, nor, indeed, closely approached, by products other than agricultural ones in contribution to the balance of trade in favor of all exports. It was not until 1898 that products other than agricultural had a balance in favor of exports, but twice since that time—in 1903 and 1910—the balance was in favor of exports. The balance in favor of the exports of these commodities was only $5,000,000 below the agricultural balance in 1912.

FOREST PRODUCTS.

Forest products were exported in 1912 to the value of $108,000,000, and this was greater than the amount for any preceding year. This is partly due to high prices, yet there were increases in the quantities of the exports of boards, shooks, rosin, and turpentine.

The imports, as well as the exports, of forest products exhibited a marked tendency to increase in value in recent years, and during these years the imports have very much exceeded the exports in value. In 1912 the imports of forest products were valued at $173,000,000, or $58,000,000 more than the foreign and domestic exports.

AGRICULTURAL CREDIT.

SURVEY OF LOCAL CONDITIONS.

INVESTIGATION IN RURAL COUNTIES.

Agricultural credit is a subject that is attracting much attention and exciting a great deal of discussion. The information with regard to what has been accomplished in cooperative credit and in the service of great mortgage banks under governmental supervision must necessarily be derived almost entirely from foreign countries. In addition to this, little is known in regard to local conditions in all parts of this country pertaining to agricultural credit. In view of the possibility of legislation concerning the subject, and more certainly to provide information useful in discussion, the effort was made early in the autumn to collect data of a descriptive sort.

A schedule of questions was sent to 9,000 persons in all of the rural counties of the United States. There were about 3,000 country bankers, about the same number of prominent farmers, and also about the same number of country merchants and men of other occupations taken from the list in use by the Bureau of Statistics to collect monthly reports of the prices of farm commodities. It thus appears that the whole country was thoroughly covered by the schedule. The nature of the questions will appear upon examining the tenor of the answers.

Three classes of correspondents were chosen in order that if any class bias appeared it would be recognized and allowances made for exaggeration or deficiency of statement. It was hardly discoverable that class bias entered considerably into the answers given. Where differences appeared among the classes of correspondents they were probably quite as much due to differences of thoroughness of information as to bias, and perhaps differences in point of view influenced the answers. At any rate the three classes of correspondents reported remarkably well and intelligently, and, no doubt, with faithful and sincere desire to contribute to a truthful description of local rural conditions bearing upon credit.

The questions were so worded as to call for answers in numerical form in order that they might be consolidated and treated arithmetically. A set of tabulations was given to each class of correspondents, and also the three classes were combined after it was observed that the differences were not usually too great to be harmonized. Probably, on the whole, the combination of the returns from the three classes of correspondents into one set of results is often nearer the fact than is indicated by any one of the three classes. However that may be, the chief results of this investigation are herewith presented with the hope that they may be of service.

ABLE TO GIVE GOOD SECURITY.

The first effort of the inquiry was to ascertain the fraction of the farmers owning their land who are able to give good security or indorsed note for a loan. In the opinion of the correspondents, 77 per cent of the farm owners may be so regarded, and the corresponding percentage for tenants is 46; that is to say, about three-quarters of the farmers owning their land and nearly one-half of the tenants are able to give good security or indorsed note for a loan. The farm owners and tenants unable to do this were then dropped from further consideration.

DEFICIENT SUPPLY.

It was next attempted to ascertain what percentage of the farmers owning their land and able to give good security or indorsed note is unable to obtain needed short-time or accommodation loans and advances because of insufficient opportunities to borrow. It appears that 48 per cent of the correspondents reported that farm owners were able to obtain such loans. The other correspondents reported that 36 per cent of the farm owners in their communities were unable to do so.

A similar question pertaining to long-time loans brought reports from 47 per cent of the correspondents that farm owners were able to obtain such loans. The remaining correspondents reported that 40 per cent of the farm owners were unable to do so. The corresponding percentages for tenants are nearly the same. It is easier to obtain short-time loans than long-time ones.

No attempt was made in the schedule to define long time and short time. This was purposely avoided in order that the correspondents might make their answers correspond to the local variations from the general fact. This general fact was that short-time loans were for periods less than one year.

CONSERVATIVE AND PROFITABLE USES.

Correspondents were requested to state what percentage, in their opinion, of the farmers owning their land and able to give good security or indorsed note would use borrowed money beyond the amount, if any, now owed by them, conservatively and profitably. Many of the correspondents answered this question in such a way as to indicate that they did not understand it; but of the answers indicating a correct understanding, 26 per cent reported that no farm owners would so use borrowed money, and the remaining correspondents who answered this question reported that 32 per cent of the farm owners would use borrowed money conservatively and

profitably. Almost exactly the same percentages are indicated for tenants able to give good security or indorsed note.

CROP LIENS.

It is with much interest that the answers concerning crop liens have been aggregated. One question asked what percentage of the farmers owning their land, who raise cotton, place a lien on the growing crop to secure advances or supplies; and this question was followed by a similar one as for 10 years ago. In the combined answers of the three classes of correspondents, 7 per cent reported that no farm owners placed liens on the cotton crop; the remaining correspondents reported that 42 per cent of the farm owners did so, and that 52 per cent of them did so 10 years ago. The decline in the percentage therefore is 10 absolutely, or about 20 per cent relatively.

Similar questions were asked concerning tenants; and of the answers, 2 per cent stated that no tenants placed liens on the cotton crop, while the remaining answers showed that 74 per cent of the tenants now place a lien on the cotton crop to secure advances or supplies, and that 77 per cent of them did so 10 years ago. The decrease is hardly perceptible.

Pursuing the subject of crop liens, 29 per cent of the reporting correspondents stated that no farmers owning their land, who raised crops other than cotton, placed liens on such crops, and the rest of the correspondents reported that 24 per cent of the farmers did so. A similar question applied to tenants and brought answers from 17 per cent of the correspondents that farm tenants did not place liens on crops other than cotton, and the rest of the correspondents reported that 40 per cent of the tenants did so.

Information of similar sort was obtained concerning personal-property mortgages. Seventeen per cent of the reporting correspondents stated that no farm owners placed liens on their live stock, farm machinery, or other personal property of the farm; and the rest of the correspondents reported that 25 per cent of them did so. The corresponding percentages for tenants are that in 7 per cent of the communities no personal-property liens were given by tenants, and that in the other communities from which reports were received 43 per cent of the tenants did so.

WAREHOUSE RECEIPTS.

In communities where elevators and other warehouses are employed for storing grain, tobacco, cotton, and other products, warehouse receipts may be pledged as security for loans. It was sought to discover the extent of this practice, and 63 per cent of the correspondents reported that it did not exist, and the remaining correspondents reported that 26 per cent of the farmers holding warehouse receipts used them for the purpose of getting credit.

SOURCES OF CREDIT.

A short analysis of the sources of agricultural credit was attempted and with considerable success. There are often various sources of credit in the same community, and it was hoped that the correspondents would be able to determine the relative importance of each.

It appears that of the principal sources of agricultural loans and advancements (not including purchase money) local banks supply 57 per cent of the total agricultural credit in communities where banks exist; neighbors supply 16 per cent in communities where they contribute anything to the supply of credit; individual lenders in near-by cities and towns supply 12 per cent in communities in which any supply of credit is derived from them; loan agents for outside capital supply 16 per cent in communities where such loan agencies exist; local general stores supply 25 per cent in communities where they contribute anything to the supply of credit; and unclassified sources of credit supply 13 per cent in the communities where these unmentioned sources of supply exist.

Local banks supply more than half of the agricultural credit, general stores supply one-quarter, and both supply more than three-quarters. The supply from neighbors is about one-seventh. The credit that is supplied from a distance, or what may be regarded as the supply from outside sources, is about one-seventh of the total supplied; and consequently it appears that about six-sevenths of the supply is derived from strictly local and near-by sources.

These conclusions apply to the communities in which these sources of credit are found. They are not found in all communities. It was reported by correspondents that in 1 per cent of the communities there was no supply of credit by banks; in 11 per cent of the communities no supply by neighbors; in 39 per cent of the communities no supply by individual lenders in near-by cities and towns; in 51 per cent of the communities no supply by loan agents for outside capital; in 47 per cent of the communities no supply by local general stores; and in 93 per cent of the communities no supply from other sources.

RANGE OF AMOUNTS OF LOANS.

An effort was made to ascertain the range of the bulk of the individual amounts of loans and advances made to farmers owning their land, but not including purchase money. In the opinion of the correspondents, the range is, on the average of answers, from $274 to $1,767; and a similar question concerning tenants indicates a range of $107 to $473.

STORE CREDIT.

There is one source of credit in rural regions in this country that is very prevalent, and yet it is rarely mentioned in discussions of

rural credit. This is the running accounts at the stores where the farm owners and tenants buy groceries and other goods without giving security. Correspondents were requested to report with regard to this, and their answers indicate that 59 per cent of the farmers owning their land have running accounts with local merchants and that 53 per cent of the tenants have such accounts in communities where this form of credit exists.

In 1 per cent of the communities it was reported that farm owners did not obtain store credit, and in 2 per cent of them that tenants did not do so. Country merchants sell goods on trust to more than one-half of the farm owners and farm tenants in their communities, and this without security.

RATES OF INTEREST.

Substantially no statistics of rates of interest paid by farmers have been collected in this country since the census of 1890; and consequently it was especially desirable that the correspondents be requested to contribute information in this investigation and report with regard to the subject. Six questions were framed, and these were answered with undoubted understanding as to the meaning of the questions. The results are of much interest.

The questions were expressed in dual form, in such a way as to call for an answer for agricultural loans and also for loans on town and city real estate, the circumstances of the loans being otherwise substantially the same.

The interest rates on the bulk of the purchase money throughout the United States range from 6 to 8 per cent in the case of farms; and also from 6 to 8 per cent in case of town and city real estate. Upon taking account of the differences in rates of interest as between farm and town property, it is discovered that in the case of purchase-money loans 10 per cent of the responses state that the rates are higher for farms than for town and city real estate; 33 per cent report that the rates are lower for farms than for town and city real estate; and 57 per cent report that there is no difference in rates of interest on purchase-money loans between the two classes.

A similar question was asked with regard to short-time loans, with the result that 11 per cent of the answering correspondents reported a higher rate for farms than for town and city real estate, 21 per cent reported a lower rate for farms, and 68 per cent reported no difference.

The same question for long-time loans induced 8 per cent of the responses to report that the rates of interest on farm loans were higher than for those on town and city real estate, 33 per cent to report that the rates were lower on farms, and 59 per cent to report no difference between the two classes of real estate.

COSTS OF BORROWING.

Rates of interest alone do not determine the cost of borrowing. There are commissions, bonuses, and various costs and expenses that are borne by the borrower, and these, if added to the rate of interest, often considerably increase it. It was reported by 22 per cent of the answering correspondents that no commissions were paid in their communities; those who stated that commissions were paid disagreed very considerably. The country banker stated that the rate of commission, when paid, was 2 per cent. The country merchant and persons of other occupations constituting another class of correspondents reported 4 per cent, and the farmers reported 5 per cent. These differences seem hardly capable of reconciling. The terms for which mortgages are made usually range from three to five years, and consequently a commission of from 2 to 5 per cent adds appreciably to the annual rate of interest.

The correspondents were requested to report costs of abstracts, if paid by the borrower, and 94 per cent of the responses reported that the borrower did not pay for an abstract. It appears from the answers by correspondents that in cases where the borrower paid for an abstract of title, or for searching the records, the average cost was $11.40, and in cases where the borrower paid the conveyancer for drawing the papers the average cost was $4.70. Sometimes, too, the borrower was required to pay the registration fee, and when he did so the average cost was $1.50.

COOPERATIVE ASSOCIATIONS.

Finally, it was requested of correspondents to state what percentage, in their opinion, of the farmers known by them and to them would be willing to form an association to receive their own deposits for loaning to themselves, and also to borrow from the outside, on the combined security of the property of all members, money to loan to themselves.

Of the correspondents, 32 per cent reported that there were no farmers who would be willing to form such an association, but the remainder of the correspondents reported that about 40 per cent of the farmers stood ready to organize such cooperative associations.

The foregoing is a brief and highly condensed statement of the chief results of this investigation of local conditions relating to agricultural credit. Numerous variations from the general facts appear in the nine geographical divisions of the States, and still more so in the different States themselves.

WORK OF THE DEPARTMENT IN 1912.

PERSONNEL.

The number of officers and employees on the rolls of the department July 1, 1912, is 1,154 greater than one year ago, and 11,414 more than on July 1, 1897, the first report under my administration. The employees located in Washington number 2,815, while 11,043 are employed elsewhere. There are now 371 more employees of the department in Washington than the entire enrollment 15 years ago, and the number located outside of Washington is 371 less than the total increase, indicating how largely the department's work has changed from office and laboratory work to field and forest investigations.

During the year 45,932 changes of every description were made, including the appointment of 32,975 temporary employments for periods of six months or less, in the forests and fields and on stations in the various States outside of Washington, D. C. The number of persons receiving probationary appointments in the classified service (equivalent to absolute appointment if the appointee is retained in the department after the probationary period) was 1,361. Eighty-four persons were reinstated and 52 were transferred from other departments, 666 resigned, 33 died in the service, and 50 were removed from the service on account of misconduct.

On July 1, 1912, there were 3,938 officers and employees on the statutory roll, comprising positions specifically appropriated for by Congress (a decrease of 70 during the year), and 9,920 were paid from lump-sum appropriations (an increase of 1,284 over last year), making a total enrollment of 13,858, not including temporary "field" employees.

There were 2,257 promotions in salary in all branches of the department and 143 reductions in salary. In the city of Washington 1,972 males and 843 females are employed, and outside of Washington the males number 10,411 and the females 632, the total female employees being 11.9 per cent of the male.

INSECTICIDE AND FUNGICIDE BOARD.

By the provisions of an act approved April 26, 1910, and known as the insecticide act of 1910, this department was made responsible for the collection and examination of samples of articles coming within the meaning of the act, and to report violations of the act to the Department of Justice.

To assist me in this work a board was created consisting of four scientists from the Bureaus of Animal Industry, Chemistry, Entomology, and Plant Industry.

As the first appropriation for enforcing the insecticide act became available on March 4, 1911, the remainder of that fiscal year was occupied with the organization of a working force and the initiation of work.

During the fiscal year 1912, 650 samples were collected, representing 330 different articles, produced by 212 different manufacturers; 246 of these cases have been disposed of, 182 being placed in permanent abeyance, while 64 have been transmitted to the Attorney General for prosecution; 7 of the latter cases have been passed upon by the courts with results favorable to the Government's contentions.

More than 200 hearings have been held during the year, 17 of which were conducted by the Insecticide and Fungicide Board and the others under the supervision of the board. Six special hearings were held by the board to discuss with manufacturers questions relating to the construction and enforcement of the insecticide act.

Six insecticide decisions were issued during the year.

OFFICE OF THE SOLICITOR.

The volume of work of the Solicitor's office has been greater than during any previous year, because of the normal growth of the department's legal business, the passage of the Weeks Forestry Act, relating to the purchase of lands for National Forest reservations, and the claims arising on the deficiency act appropriating funds for the relief of those rendering service during the forest fires of 1910.

Additional work has been called for in preparation of briefs and in correspondence connected with the increased number of violations detected by the vigilance of the department's inspectors under the National Forest law, the food and drugs act, the meat-inspection law, the 28-hour law, the animal quarantine laws, and the insecticide and Lacey acts.

Frequent advice has been given the several bureaus, divisions, and offices on questions of law relating to the discharge of the varied duties intrusted to them, and the Solicitor has attended, as representative of the department, all the hearings conducted by the House Committee on Expenditures in the Department of Agriculture.

FOOD AND DRUGS ACT.

The provisions of the food and drugs act have been vigorously enforced during the year, and 1,459 violations were reported to the Department of Justice, an increase of more than 25 per cent over the number reported last year. Of these, 991 were criminal cases and 468 were recommendations for seizure of adulterated or misbranded foods and drugs.

The first jail sentences for violation of this act were imposed during the year, and there was a tendency on the part of the courts to im-

pose larger fines for first offenses. Fines amounting to $14,000 were imposed in criminal cases, and the costs were generally assessed against the defendants. In the seizure cases, decrees of condemnation and forfeiture were entered against 294 shipments of adulterated and misbranded goods. One hundred and three shipments consisting of filthy, decomposed, or putrid substances, or containing added poisonous or deleterious ingredients, which might render them injurious to health, were destroyed, and in several instances such cases have been reported for criminal prosecution. Six hundred and fifty-five Notices of Judgment of terminated cases have been published, and over 300 are in course of preparation.

WORK FOR THE FOREST SERVICE.

During the fiscal year 1912 the Solicitor rendered 93 formal and 1,148 informal written opinions to the Forest Service on the legal phases of questions arising in connection with the administration of the National Forests. One thousand two hundred and fifty contracts, leases, bonds, and right-of-way stipulations were prepared and examined for sufficiency of execution. One thousand five hundred and sixty-eight cases involving contested claims to lands within the National Forests were handled during the year. These cases involved upward of 400,000 acres of land, supporting many million feet of valuable merchantable timber. Final action was taken by the Secretary of the Interior or the Commissioner of the General Land Office in 622 of the above cases, of which 462 were decided favorably to the United States. The office filed 241 briefs in contested-claims cases during the year and prosecuted 21 appeals, with accompanying briefs, to the Secretary of the Interior from adverse decisions of the commissioner, and made 5 oral arguments before the Secretary. Depositions were taken by the office in 75 cases. Regulations for the administration of the National Forests were revised during the year and upward of 50 proclamations and Executive orders eliminating lands from the National Forests were either prepared or passed upon by the office. The office handled 406 cases of grazing, timber, fire, and occupancy trespasses on the National Forests. Those which were concluded favorably to the Government during the year resulted in the payment into the Treasury of $67,322.54, and in several criminal cases substantial jail sentences were imposed. Punitive, in addition to actual, damages in the sum of $704.70 were recovered during the year in cases involving illegal grazing on the forests. The office passed upon 56 applications for power permits and heard 2 oral arguments of attorneys for applicants for conflicting permits. Upward of 60 complaints, briefs, and indictments were prepared at request of the United States attorneys during the year; 123 claims for relief and reimbursement under the appropriations made by Congress in consequence of the forest fires in the

fall of 1910 were examined by the office; and 39 contracts for the purchase of lands for the protection of watersheds of navigable streams under the act of March 1, 1911, were prepared during the year.

TWENTY-EIGHT-HOUR LAW.

Six hundred and thirty-one violations of the 28-hour law were reported for prosecution, as compared with 598 cases reported in the fiscal year 1911. Penalties were recovered in 357 cases, amounting to $28,400. Costs were assessed against the defendants in these cases amounting to $2,937.13. In the fiscal year 1911 penalties amounting to $26,075 were recovered in 258 cases, with costs in the sum of $5,783.85. There were 967 cases pending at the close of the year, as compared with 807 cases pending on June 30, 1911.

LIVE-STOCK QUARANTINE ACTS.

One hundred and thirty-five violations of the live-stock quarantine acts were reported for prosecution. Of these, 124 were violations of the act of March 3, 1905 (33 Stat., 1264), and 11 were violations of the act of May 29, 1884 (23 Stat., 31). The total number of cases of this class exceeded the number reported during the preceding fiscal year by 35 per cent. Fines aggregating $6.125 were imposed in 68 cases prosecuted during the year, and the costs of the proceedings were uniformly assessed against the defendants. In 1911 fines were imposed in 51 cases, amounting to $5,580.

MEAT INSPECTION.

Eighty-five violations of the meat-inspection amendment (34 Stat., 674) were reported for prosecution, a decrease in number of 16 as compared with the fiscal year 1911. Sixty-five cases were prosecuted successfully during the year, and fines were imposed amounting to $4,746.75. In 3 cases sentences of imprisonment were imposed. In the fiscal year 1911 fines amounting to $3,240 were imposed in 43 cases. Four cases resulted in verdicts for the defendant in the fiscal year 1912. In 1911 but 1 case was terminated adversely to the Government. At the close of the fiscal year 71 cases were awaiting prosecution.

INSECTICIDE ACT.

The first apparent violation of the insecticide act of 1910 was reported for prosecution in December, 1911. In all, 58 cases under this statute were reported during the year. Six of these cases resulted in convictions, and in one a decree of condemnation and forfeiture was entered. The goods in the latter case were subsequently released to the claimants under bond after payment of the

costs. The Insecticide and Fungicide Board has completed its organization for obtaining evidence of violations of this statute.

LACEY ACT.

Thirty-four cases involving the unlawful shipment of game were reported for prosecution under the Lacey Act (secs. 242 and 243, Penal Code). The Biological Survey has arranged, through cooperation with State officials, to trace such shipments more effectively, and it is expected that this plan will contribute materially to the detection of violations of this statute. Six cases presented during the year 1912 resulted in convictions. In one case the defendant was acquitted.

OTHER WORK.

Three hundred and fifty-seven contracts and leases were prepared for the several bureaus, offices, and divisions of the department, in addition to those prepared for the Forest Service in the field. During the fiscal year 1911, 339 contracts and leases were prepared for the same bureaus, offices, and divisions.

Nineteen applications for letters patent on inventions of employees of the department, for dedication to the public, were filed in 1912, more than double the number filed in 1911. Ten patents were allowed during the year and 2 were disallowed. In 1911, 10 patents were allowed and there were no disallowances.

During the fiscal year ending June 30, 1912, 20 claims for balances due the estates of as many employees of various branches of the department who died intestate were examined, the necessary papers prepared for the payment of the same, and advice furnished administrative officers of the department relative thereto.

PUBLICATIONS OF THE OFFICE.

In addition to the 655 Notices of Judgment published by authority of section 4 of the food and drugs act and discussed in detail in another part of this report, the office issued 11 circulars, embodying decisions of the courts construing the statutes intrusted to the department for execution. Six of these embodied decisions on cases arising under the 28-hour law, 3 under the food and drugs act, 1 under the National Forest administrative act, and 1 a decision of the Attorney General under the meat-inspection law. There was also published during the year a supplement to the annotated edition of the 28-hour law issued on October 2, 1909, thereby bringing up to date the original edition. The office also published a compilation of references to the legislative history of acts of Congress enforced by the department for use in connection with the construction of any of the provisions contained in such statutes.

At the close of June 30, 1912, the office had in preparation a revision of the compilation entitled "Laws Applicable to the Department of Agriculture," the first edition of which was published in 1908, and embraced a compilation of all statutes, in effect at that time, applicable to the Department of Agriculture. There was also in preparation an appendix to the Use Book of the Forest Service embracing all of the general laws, reference to which is found necessary in the daily administration of the National Forests.

WEATHER BUREAU.

INVESTIGATION AND RESEARCH.

A series of practically continuous explorations of the upper atmosphere extending over the last five years has been concluded at the Mount Weather Observatory with highly satisfactory results. It has been shown beyond question that the meteorological conditions disclosed by kite flights are often susceptible of utilization in the preparation of weather forecasts. The data for the five-year series of observations are in course of summarization and will soon be in suitable form for further study. A report on the sounding-balloon ascensions made in the Western States in 1909, 1910, and 1911 has also been completed and published in the Mount Weather Bulletin. On the whole, this report forms the most important contribution to the meteorology of the higher atmosphere thus far made in this country. The atmospheric conditions at extremely high levels as disclosed by the balloon flights are not wholly in accord with the conditions that have been found to exist at similar levels over continental Europe. It is evident that further explorations of this character will be necessary in the United States to confirm the results arrived at in the report mentioned.

Studies of temperature conditions on mountain tops and in adjacent valleys have been continued at Mount Weather and elsewhere and the conclusions relating thereto published in the Mount Weather Bulletin. The results obtained have tended to fix the relation between prevailing weather conditions and the character and degree of temperature changes that may be expected to follow in the valleys below. These studies have an important bearing on the question of air drainage and, in their practical application, to the protection of fruit in the valleys and on mountain slopes given over to its production.

FORECASTS AND WARNINGS.

The forecasts and warnings issued by the Weather Bureau for all interests liable to be affected by coming weather conditions were veri-

fied in every important instance. The world-wide survey of atmospheric conditions presented by the synoptic charts for the northern hemisphere has continued to be of great value in the preparation of general weather and temperature forecasts for the United States for a week in advance. During the year the field of observation over the northern hemisphere was materially extended, reports having been added from the Aleutian Islands by wireless and from stations in Japan and China by cable. Cable observations are also being received daily from an increased number of stations in Russia.

By direction of the Secretary the Chief of the Weather Bureau visited England during the year for the purpose of taking part in the International Radiotelegraphic Conference held at London on June 4 to July 6, inclusive. As a result of his intercessions, which were indorsed by all the delegates from the United States, the conference agreed to an international regulation which shall give weather observations the right of way over all messages except distress calls. This is an important regulation and will make it possible in time to organize complete ocean weather services, the value of which to life and property through the issue of warnings to shipping at sea can not be estimated. A valuable extension already inaugurated in the weather service is the receipt by radiotelegraphic communication of reports from vessels at sea along the middle and south Atlantic coasts and in the Gulf of Mexico and Caribbean Sea, those being the regions traversed by tropical storms before reaching our coasts. With the further perfection of the wireless service these reports will become of increased importance.

Among the more striking weather features successfully forecast during the year were: The cool weather following the prolonged hot wave in July, 1911; the hurricane of August along the Georgia and Carolina coasts; the freezes in the west Gulf States in November; the severe freeze in California during December; the record-breaking cold wave of January; and the heavy snowfalls in the Middle West during the winter of 1911–12. The warnings issued in advance of the two severe freezes in the west Gulf States in November enabled sugar, orange, and truck growers to protect crops to the value of several million dollars that would otherwise have been lost. During the December freeze in California the citrus crop, valued at $40,000,000, suffered damage to the amount of about $6,000,000. This loss resulted from an inadequacy of facilities for general smudging. Where smudging was done, not only the fruit buds but trees in bloom were saved from injury. But for the frost warnings of the Weather Bureau at this time and the cooperative efforts of the orange growers the loss would have approximated $20,000,000.

RIVERS AND FLOODS.

The flood in the lower Mississippi River during the spring and early summer of 1912 was the greatest in its history, and entirely overshadowed similar disasters in other portions of the country, although numerous and widespread floods occurred elsewhere during the year, the Pacific Coast States alone escaping on account of deficient precipitation. In the Mississippi flood all previous high-water marks were exceeded from Cairo to the Passes except in the vicinity of Vicksburg, Miss. The flood began in March and reached its maximum at New Orleans, La., early in May; at the end of June the flood waters were still flowing through the Hymelia crevasse above New Orleans. Of the entire territory subject to overflow about 17,600 square miles, or 59 per cent, were flooded. The losses are believed to have reached $75,000,000, and may possibly reach $100,000,000, the greater portion representing the loss of the season's crops. In its forecast of flood stages and its warnings of danger to residents in the threatened territory the bureau maintained the high degree of accuracy characterizing its previous flood work on the Mississippi River. Through the flood warnings many lives were saved. The forecast for the highest stage in the river at New Orleans was issued nearly five weeks in advance, and its absolute accuracy, despite complications caused by crevasses and subsequent heavy rains, was a triumph of forecasting skill. A report on the Mississippi flood, already begun, will be prepared jointly by the Department of Agriculture, the War Department, and the Department of the Interior, each department dealing only with such features as come within its particular province.

Floods elsewhere were forecast with the usual timeliness and accuracy. The total flood losses reported during the year were about $86,000,000, of which about $11,000,000 were incurred outside the lower Mississippi Valley. These figures are far from complete; it is reasonably certain that if all losses were reported and more detailed statements obtained the total would be brought up to at least $110,000,000, against a total of less than $8,000,000 for the year ended June 30, 1911, and of about $14,000,000 for the year before. The total value of property saved through the flood warnings of the past year is estimated at $19,000,000.

The measurement of the winter snowfall was continued in the mountain regions of the West as a basis for the forecasting of the amount of water likely to be available for agricultural and commercial purposes during the succeeding spring and summer. While this work is still in an experimental stage, the forecasts based on the surveys and measurements made in the Maple Creek (Utah) watershed in the spring of 1911 were of much value to water users, and

the surveys and measurements made in the spring of the past year promise equally valuable results.

The study of the effect of forests on climate and stream flow has been continued in the Rio Grande National Forest, Colo., during the past year, and complete data for nearly two years have now been obtained. It was at first thought that this study, carried on at a great elevation and in a supposedly semiarid region, would not afford a basis for legitimate comparison with data obtained from the more humid regions of the East, but it now appears that the final results will permit of more general application than was earlier supposed. Observations of a similar character, though more limited in scope, are being made in other national forests in Minnesota, Idaho, Colorado, Utah, Arizona, and California.

OBSERVATIONS AND REPORTS.

The observations and reports furnished by the 197 regular Weather Bureau reporting stations of the first order form, in the main, the basis for the weather maps and general daily weather information issued to the public. In addition to these, however, there are 75 special meteorological stations that render telegraphic reports and that are maintained as adjuncts to the work of the forecaster in making special frost predictions for the fruit, truck, vineyard, and cranberry interests of the various portions of the country. Of the 158,636 telegraphic observations due from these stations during the year, only 1 was missed, and that through an accident to the observer.

Of the special services devoted to the interests already mentioned, that carried on in relation to the fruit industry has been given the greatest extension during the year. These extensions have been made largely in California, Oregon, Washington, Idaho, Utah, Colorado, and North Carolina. In North Carolina numerous "orchard" stations have been established, and a special investigation is being made in the Blue Ridge Mountains in regard to the thermal belts that are particularly favorable for the development of the fruit industry, owing to their practical immunity from damaging frosts. In addition to the services already mentioned, observations were taken at more than 400 special stations in the corn, wheat, cotton, sugar, and rice growing States, and daily statements of temperature and rainfall were issued during the growing season in the interest of the staple crops produced in the districts covered by the reports. There are also about 4,000 cooperative stations at which daily observations of weather and temperature are made and from which monthly reports are received by mail. These reports are of value in establishing the climatic conditions of the country.

The distribution of Weather Bureau forecasts and warnings has been extended wherever practicable during the year, by means of the

telegraph, telephone, and mail service, the total number of persons receiving the forecasts daily by telephone alone being estimated at more than 5,000,000 at the close of the year.

The distribution of daily weather information by means of weather maps was largely increased through the extension of the publication of weather maps in the daily newspapers. This form of issue is now being made in 147 papers, with a total daily circulation to nearly 3,000,000 subscribers.

MARINE WORK.

The Weather Bureau has continued the preparation of meteorological charts of the North and South Atlantic, North and South Pacific, and Indian Oceans, and of the Great Lakes. These are published monthly, except the South Atlantic and South Pacific, which are issued quarterly. The charts portray graphically the meteorological elements over the oceans and contain much additional information of interest to mariners. The meteorological data upon which they are based are collected from vessels of all nationalities. During the past year 2,291 vessels, representing 24 different nationalities, cooperated with the Weather Bureau by furnishing reports of observations; reports were also received from 261 land stations, making a total of 2,552 cooperating marine observers.

On April 1, 1912, the Weather Bureau inaugurated on the Atlantic and Gulf coasts a vessel weather service on 30 vessels sailing between New York and New Orleans and points in the West Indies. These vessels are equipped with barometers, and take observations twice daily when 70 miles or more from the port of departure or port of entry. These observations are radiographed to the nearest wireless station on the coast and sent thence over the land lines to Washington, where they are utilized in the preparation of weather forecasts and warnings. A vessel weather service has also been started on the Pacific coast. Arrangements have also been made for the broadcast dissemination of forecast messages and storm warnings over the ocean, to the extent that the present service will permit, through cooperation with the Naval Wireless, the United Wireless, the Marconi, and the United Fruit Telegraph services on the Atlantic, Gulf, and Pacific coasts.

A vessel-reporting service, providing for the prompt transmission of communications between interested organizations and individuals regarding passing vessels, wrecks, and marine disasters, has continued in operation at the Weather Bureau stations at Block Island, Cape Henry, Sand Key, Southeast Farallon, Point Reyes Light, North Head, Port Crescent, and Tatoosh Island. This service is especially comprehensive in its operation at the Cape Henry station, which reported not less than 19,876 passing vessels during the year.

Numerous instances were reported where the Weather Bureau observers on the lookout at these reporting stations sighted vessels in distress and sent out the word that brought the revenue cutters and the tugs of wrecking companies to the rescue.

NEW APPARATUS.

Rain and snow gauges having special shield devices were installed for comparative observations at stations in Colorado, Yellowstone Park, and Utah during the year. In all cases the records of snowfall obtained from these gauges were from 20 to 25 per cent greater than those obtained by the ordinary snow gauge. Further structural modifications will be made in these gauges in order to overcome difficulties that are still encountered in the effort to obtain a catch that will represent the true amount of precipitation.

Special instrumental equipments were installed at stations in Minnesota, Idaho, Utah, and California, in connection with experiments being carried on in cooperation with the Forest Service.

Instruments for obtaining records of humidity and temperature have been supplied to the Bureau of Mines for use in a study of the causes and prevention of mine disasters.

The study of conditions favorable for the formation of frost in the fruit districts of the country has called for a large distribution and installation of instruments at the special observing stations.

Weather Bureau kiosks constructed for the display of weather instruments at conspicuous places in large cities were furnished to 10 additional stations during the year.

The development of special apparatus for the measurement of solar radiation was extended during the year, and a number of stations in the West and Southwest were equipped with pyrheliometers for the purpose of making observations.

Special instrumental devices for the study of wind movement at high velocities have been developed during the year. By means of the tests proposed through their use it will be possible to determine the higher wind velocities more accurately than now secured by means of the cup anemometer, it being recognized that the velocities as at present obtained are increasingly erroneous with the increase of the rate above 50 to 60 miles an hour.

SCHOOL OF INSTRUCTION.

There has been established at Mount Weather a school of instruction at which newly appointed assistant observers will be given a thorough training in the meteorological and other duties to which they will later be assigned. The observation station will be conducted exactly as a regular station of the bureau. The course of instruction includes a training in observational methods and the

preparation of meteorological reports and in the construction and upkeep of meteorological instruments.

BUREAU OF ANIMAL INDUSTRY.

THE MEAT INSPECTION.

The meat inspection, which is carried on at slaughtering and packing establishments engaged in interstate or export trade, continues to show an increase in volume and has about reached the limit of the standing annual appropriation of $3,000,000 made by the law of 1906. To provide for the future extension of this work, which is necessary if it is to be applied to all products and establishments coming within the law, an increase of $300,000 has been requested in the estimates for appropriations for the coming fiscal year.

During the fiscal year 1912 inspection was conducted at 940 establishments in 259 cities and towns. There were inspected at time of slaughter 59,014,019 animals, consisting of 7,532.005 cattle, 2,242,929 calves, 34,966,378 hogs, 14,208,724 sheep, and 63,983 goats. This constitutes an increase of over 6,000,000 in the total number of animals inspected as compared with the preceding year. The greatest increase was in hogs, of which over 5,000,000 more were slaughtered in 1912 than in 1911. There was a slight decrease, however, in the number of cattle. On account of disease or other unwholesome condition 203,778 entire carcasses and 463,859 parts of carcasses were condemned, making a total of 667,637 carcasses condemned wholly or in part. The condemnations were as follows: Cattle, 50,363 carcasses, 134,783 parts; calves, 8,927 carcasses, 1,212 parts; hogs, 129,002 carcasses, 323,992 parts; sheep, 15,402 carcasses, 3,871 parts; goats, 84 carcasses, 1 part. Tuberculosis continued to be the cause of a high proportion of condemnations of cattle and hogs. In addition to the foregoing condemnations at the time of slaughter there were condemned on reinspection 18,096,587 pounds of meat and meat food products that had become unwholesome or otherwise unfit for food since the inspection at the time of slaughter.

Inspection certificates issued for exports of meat and meat food products during the year covered 1,114,279,558 pounds. This was a slight increase over the preceding year. Farmers and retail butchers and dealers are exempted from inspection by the law, but supervision is given to interstate shipments by such persons. During the past fiscal year 116,536 shipments were made by retail butchers and dealers holding certificates of exemption, the products so shipped amounting to 20,493,837 pounds.

During the year 26,889 samples of various products were examined in the meat-inspection laboratory for the purpose of detecting prohibited preservatives or coloring matter, adulterants, and unwhole-

someness of various kinds, and passing upon the purity of condiments, water supplies, etc. The results show no attempts to use prohibited preservatives and coloring matters. The condemnations resulting from laboratory inspection have been made principally because of rancidity of oils and fats and the use of cereals in prepared meats without proper declaration on the label.

By comparing the census figures and the department's statistics it is calculated that in 1909 (the year covered by the last census) 58.12 per cent of all the meat slaughtered in the country was Federally inspected. As the Government inspection has been slightly extended in the subsequent three years, it is estimated that the proportion slaughtered under Federal inspection at the present time is about 60 per cent. Most of the uninspected remainder consists of slaughter by local butchers and by farmers.

HORSE BREEDING.

The horse-breeding investigations in Colorado, Vermont, and Iowa have continued with good progress. In the Colorado experiments in breeding carriage horses there were in the stud at the close of the fiscal year 77 animals, including 22 stallions and 55 mares. Of 14 foals dropped during the year 11 are alive and thrifty. The average excellence of the foals is above that of previous years.

At the Government Morgan horse farm at Middlebury, Vt., there were at the close of the fiscal year 69 animals, consisting of 19 stallions, 44 mares, and 6 geldings (work horses). One stallion, 1 mare, and 2 fillies of approved type and breeding were purchased in Kansas and added to the stud during the year. One of the stallions is still leased to the Massachusetts Agricultural College for breeding purposes. During the breeding season of 1912 an opportunity was given to farmers in Vermont to breed to stallions at the Morgan horse farm under the provisions of the plan for Army-horse breeding.

The culling of inferior animals is continued each year by a board of survey, so as to retain in the Colorado and Vermont studs only such individuals as conform to the desired types.

In the cooperative work of breeding gray draft horses at the Iowa Experiment Station there are 3 stallions and 9 mares. Four foals were produced during the year.

A good start has been made with the plan of breeding horses suitable for Army use, as outlined in last year's report. Two stallions were stationed in Virginia for breeding with approved mares, and during the year 38 mares were bred and 11 foals produced. It is too early to report upon the foals, but it is evident that farmers owning mares of satisfactory type are willing to have them bred to the Government stallions on the terms proposed by the Government. With the provision made by Congress this work will be extended

during the coming year, and it is hoped that within a few years a considerable number of suitable horses will be available for the Army.

CATTLE BREEDING.

In the breeding of Holstein cattle in cooperation with the North Dakota Experiment Station good results were obtained during the year, although the records made by the cows were not as large as during the preceding year because of shortage of feed production. Six heifers were put into the Advanced Registry during the year. A large number of grade heifers have been sold from the circuit, and the surplus pure-bred bulls have been sold readily, most of them going to farmers in the immediate vicinity. The benefits of the work are therefore not confined to the herds in the circuit.

A substantial increase in the production of milk and butterfat was made by the herds in the cooperative experiment in breeding milking Shorthorn cattle at the University of Minnesota. There has been an increase of almost 1,000 pounds of milk per cow during the last two years. At the end of the fiscal year the department's cooperation in this work ended.

SHEEP AND GOATS.

Experiments in sheep breeding are being carried on in Wyoming, Vermont, and Maryland. In the Wyoming investigations, in which an effort is being made to improve the wool and mutton qualities of range sheep, the wool clip of the past year was the best in quality obtained since the experiment was inaugurated, although the average weight was slightly less than in the preceding year. The Southdown flock, at the Morgan horse farm at Middlebury, Vt., has done well. A good lamb crop was secured, and the wool clip was the best since the flock was founded.

Experiments in breeding sheep and goats are also in progress at the farm of the Bureau of Animal Industry at Beltsville, Md., where various breeds are being crossbred with Barbados and Karakule sheep. The object of the goat-breeding experiments is to obtain a strain of milking goats. An exceptionally good crop of kids was obtained this year.

POULTRY AND EGG INVESTIGATIONS.

The experiments in breeding Barred Plymouth Rock fowls for increased egg production at the Maine Experiment Station are approaching a close, as the final solution of the main features of the problem of the inheritance of egg production has been reached. These results will be made available in publications.

Studies of the commercial fattening and marketing of poultry in the West have been continued and some of the results published.

In the endeavor to reduce the loss from bad eggs the department advocates the production of infertile eggs; that is, eggs from hens that are not allowed to run with male birds. It is estimated that the losses from bad eggs amount to $45,000,000 a year, and that one-third of this is caused by the formation of "blood rings" due to the development of the germs in eggs by heat. If farmers and poultrymen will produce infertile eggs, this part of the loss can be prevented, and the losses can be further reduced by proper methods of handling and marketing. What is known as the "loss-off" method of buying eggs—that is, buying on a quality basis—is advocated, and cooperative work to establish this method has been carried on in some of the leading egg-producing States. Publications, including a poster, have been issued showing the advantage of producing infertile eggs.

THE ERADICATION OF ANIMAL DISEASES.

Continued progress was made during the year in the systematic work of eradicating certain diseases of live stock. As a result of work which is being carried on in cooperation with State and local authorities for the eradication of the ticks which transmit the contagion of Texas fever of cattle, 22,827 square miles of territory in the South were released from quarantine, and since the close of the fiscal year 2,248 additional square miles have been released. The total area freed from ticks and released from quarantine since the beginning of this work in 1906 now amounts to 164,896 square miles, which is nearly one-fourth of the total territory infested at the time the work was begun. The pioneer work is naturally the hardest part of the task, and it is believed that with adequate appropriations more rapid progress can be made in the future. It is evident that the days of the tick are numbered and that the South will soon enter upon an era of the development of stock raising and will have a large part in meeting the needs of our people for a greater supply of meat.

The work of eradicating scabies of sheep and cattle in the West, which has been under way for many years, is nearing completion. The area released from the sheep scab quarantine during the fiscal year amounted to 9,177 square miles.

An outbreak of dourine among horses appeared in Iowa early in the summer of 1911 and has been entirely eradicated, although horses involved in the outbreak had been as widely scattered as Texas, Arkansas, and Canada.

TUBERCULOSIS.

Further experiments in the vaccination of cattle to prevent tuberculosis confirm the previous conclusion that this method is not safe and can not be recommended in the present stage of its development.

Such vaccination involves the use of living tubercle bacilli of a mild strain, and it is found that these mild germs sometimes remain in the vaccinated cattle for some years and are discharged in the milk. It appears, therefore, that the result of such vaccination would be to harbor the infection in a mild form in some cases.

The bureau has continued its work for the suppression of bovine tuberculosis by applying the tuberculin test in certain sections of the country where cooperative arrangements have been made with State and city authorities, and also by testing breeding and dairy cattle for interstate shipment. The testing in Virginia and Maryland shows over 18 per cent of tuberculous cattle among those tested for the first time, and only 3 per cent in herds to which the test had been previously applied and from which the reacting animals had been removed. In the District of Columbia the proportion of tuberculous cattle on first test in previous years was nearly 19 per cent, but on retests made during the past year it was only a little over 1 per cent. As a result of this work a large number of previously infected herds are now being maintained free from tuberculosis.

HOG CHOLERA.

Officials in various States and farmers and stock raisers generally have shown increased interest in the work of combating hog cholera through the use of the serum developed by the Bureau of Animal Industry. At the present time 30 States are distributing serum. In most of these States the serum is prepared in official laboratories, but a few of the States purchase their supply from private manufacturers and distribute it to the farmers at cost. In some of the States preparing their own serum no charge is made to the farmers for the serum, while in other States the cost price of manufacture is charged. Up to this time considerably more than 1,000,000 doses of hog-cholera serum have been manufactured and applied in all of the various States combined, and the results are reported by State officials generally as being very satisfactory.

The demand for hog-cholera serum has been greater than could be met by the State laboratories and has led to its preparation by commercial firms. In order to insure that only a reliable quality of serum is sold in interstate commerce it is desirable that the department should be given legal authority to supervise the preparation of the serum.

The scientific investigations of the past year with regard to hog cholera have been devoted to determining the best methods of preserving by means of chemicals the hog-cholera virus that is necessary in the production of the serum. Experiments have also been made to learn whether or not the offspring of immune sows are likewise immune to hog cholera, and it seems evident that pigs from such

sows are themselves immune at birth and that this immunity lasts for at least three weeks.

INVESTIGATION OF OTHER ANIMAL DISEASES.

The scientific staff of the Bureau of Animal Industry has continued the investigation of the causes and nature of various diseases of live stock. Perhaps the most important work of the year has been that relating to infectious abortion. This disease rivals tuberculosis as a plague of the cattle industry. The germs causing infectious abortion frequently occur in milk, and have also been found in the tonsils of children, where they have probably been conveyed by milk. Inoculation experiments show that these germs have the power to produce distinct lesions in guinea pigs. Just what effect this organism may have on human health has not yet been determined, but our present knowledge seems to afford another reason for the pasteurization of milk as a safeguard against various infectious diseases.

What is known as the complement-fixation test has been found to be an exceedingly reliable and prompt means of diagnosing certain diseases the determination of which has hitherto been attended with some uncertainty and delay. The bureau has extended the use of this test to a number of diseases.

That rabies (or hydrophobia) is a continued menace is shown by the fact that 183 animals suspected of having this disease were sent to the pathological laboratory for diagnosis, of which 112 cases were found to be positive. While most of the cases occur in dogs, an unusually large proportion of cats were received. The best known means of getting rid of this disease is the muzzling of all dogs for a sufficient period. Muzzling orders are sometimes issued, but it is difficult to secure their thorough enforcement.

Among other diseases concerning which investigations were made during the year are forage poisoning, or cerebrospinal meningitis, swamp fever, dourine, tetanus, chronic mastitis, and Malta fever. It seems that the latter disease has existed among goats in Texas and New Mexico for many years. It is passive in goats, but causes serious illness in man, to whom it is communicated from the goats. It is important that steps should be taken to eradicate this disease from the goats, especially since there is a growing tendency to use goats' milk as food for infants and invalids. The infection of man may be guarded against by pasteurizing goats' milk where there is any reason to suspect that the infection may be present.

DISTRIBUTION OF VACCINE, ETC.

During the year 1,340,380 doses of blackleg vaccine were prepared and distributed to stock raisers by the Bureau of Animal Industry. Reports of the use of this vaccine continue to show the same favorable

results as reported in previous years, when the death rate showed a reduction to less than one-half of 1 per cent.

Tuberculin and mallein are furnished to State, county, and municipal officials for the diagnosis of tuberculosis and glanders, respectively. During the past year 329,771 doses of tuberculin and 135,699 doses of mallein were sent out.

EXPORT AND IMPORT ANIMALS.

During the fiscal year there were made 209,715 inspections of American and 27,270 inspections of Canadian animals for export. The number of animals actually exported was 142,564. The greater number of inspections is accounted for by the fact that many of the animals were inspected two or more times. This work also includes the supervision of vessels, of which 314 inspections were made.

For shipment to Canada there were inspected and tested with tuberculin 858 cattle, and inspected and tested with mallein 25,110 horses and 1,426 mules. There were also inspected for shipment to Canada 58,783 sheep, 234 goats, and 39 hogs. For shipment to the Hawaiian Islands there were tested with tuberculin 130 cattle and with mallein 317 horses and 346 mules.

A strict inspection, with quarantine in certain cases, is maintained over all animals imported from foreign countries, in order to exclude the numerous animal diseases which are prevalent in other parts of the world. For this purpose hay, hides, wool, etc., are also inspected and disinfection required. The total number of import animals inspected during the year was 379,822, and of these 3,542 were quarantined in accordance with the regulations.

DAIRY FARMING.

The work for the development and improvement of dairying in the South has been continued, and similar work has been extended in the West. The object is to introduce dairying in new sections and to improve dairy methods, including the breeding and feeding of the herds, as well as the handling of the milk. This work is being done in cooperation with State authorities and institutions. There is a particularly fine field for dairying in the irrigated regions of the West where alfalfa is produced. In the South and West 167 silos were built as a result of their advocacy by the department. A larger number are contemplated for the coming year. In some regions the silo is practically unknown, and when one is built it serves as an object lesson to the entire community.

Dairy farmers are also encouraged to keep accurate records of their herds, so that they may know which animals are profitable and

unprofitable and get rid of the latter. By this method the breeding of herds is steadily improved, better feeding methods are adopted, the average production of cows is increased, and greater profits are obtained.

The cow-testing association is another means of promoting the improvement of dairy herds, and embodies also the keeping of herd records. There are now 97 active cow-testing associations in the United States out of 118 which have organized since 1905. One of the greatest difficulties is to secure efficient men to supervise the associations.

MARKET MILK INVESTIGATIONS.

The work for the improvement of market milk has been continued and consists mainly in introducing and maintaining the score-card system of inspection, assisting in competitive exhibitions of milk and cream, and investigating the conditions surrounding the milk supply in various places. During the year cooperative work has been carried on with 21 cities and 11 States. Practically all cities in the country are now using some form of score card; the department has records of 170 such cities. Some of the handicaps to obtaining a milk supply of good quality are that municipalities fail to provide sufficient funds, the inspection work is sometimes made inefficient by political domination, and consumers fail to appreciate the fact that the production of clean milk involves additional expense. In campaigns for better milk the attempt is too often made to place the entire cost of improvement on the producer. Some incentive ought to be offered to the producer to supply the higher grades of milk. The fact is that most consumers are not demanding a high grade of milk, especially when this involves slight additional cost. It is well recognized that the health authorities of the country generally are seeking to give the public a higher grade of milk than the public is demanding or is willing to pay for.

DAIRY MANUFACTURES.

Work is being conducted with a view to assisting creameries in better methods of operation and business management and in improving the quality of their products. Reports were received from 1,500 creameries during the year, and on the basis of these reports advice has been given by correspondence and sometimes by visits for the purpose of remedying defects and bringing about needed improvements. The grading of cream is recommended as a method of securing better cream and producing better butter. Although there has been some improvement, a great deal of inferior cream is still

received at creameries and buying stations, and much of this is utterly unfit to be made into a food product. Investigations during the year showed that 61 per cent out of 1,554 lots of cream were of third grade—that is, dirty, decomposed, or sour—and that 94.5 per cent of the creameries investigated were insanitary to a greater or less degree. Pasteurization was practiced in only 27 per cent of the creameries. These conditions make a system of inspection of dairy products very desirable. Recommendations on this point are contained in the report of the Chief of the Bureau of Animal Industry.

DAIRY RESEARCH LABORATORIES.

The dairy research laboratories have continued their work upon various technical problems connected with milk, butter, and cheese. Extensive experiments regarding the influence of breed, individuality, and feeds on the composition of milk are under way at Columbia, Mo., in cooperation with the State agricultural experiment station, and some of the results of this work are in course of publication.

Work on the manufacture of butter for storage has been completed, and the results consistently show a much higher keeping quality in butter made from sweet pasteurized cream than in butter made in the usual way. Aside from the commercial advantages, butter made by this method is much safer for human health, as pasteurization removes the danger from disease germs that are liable to exist for considerable periods in butter made from unpasteurized cream.

The investigations concerning the Swiss, Cheddar, Camembert, and Roquefort types of cheese have been continued and additional knowledge has been obtained which will be of value in the production of those kinds of cheese. The experiments with European varieties of soft cheese have been carried far enough to indicate the possibility of making cheese of the Camembert type in this country, although no manufacturer has appeared to be entirely successful as yet.

BUREAU OF PLANT INDUSTRY.

A review of the work of the Bureau of Plant Industry for the fiscal year 1912 is included in the Record of Sixteen Years, see pages 117 to 144.

BUREAU OF CHEMISTRY.

POULTRY AND EGG INVESTIGATIONS.

The conservation policy of this department is being extended to the saving of foodstuffs that are now wasted, so that our people may continue to have enough wholesome food to eat. The farmer produces a good article, but because of deterioration during marketing it is sometimes an inferior food when it reaches the consumer, or, worse still,

it is destroyed as unfit for food before marketing. The Food Research Laboratory is studying the preservation of quality in perishable products as well as the prevention of decomposition.

Better methods have been devised for the handling of dressed poultry from producer to consumer and their adoption by the industry is growing. It is this phase of the work, however, which must be pushed if the scientific findings of the laboratory and field experimentation are to yield more food and better food to the people and surer returns to the industries. Years of study have shown that in most instances it is comparatively easy to determine in the laboratory and by experimental observation wherein the shipper errs or the middleman fails; it is an extremely difficult matter to get this information to the shipper or middleman in such wise that he will understand, believe, and apply it. The publication of accounts of the work is helpful, but personal contact between the investigators and the industries is infinitely more effective. Visits to individual packing houses are most prolific of results, but comparatively few people can be reached in this way. Addresses at meetings and conversations with their representatives are the most helpful and economical means now had for reaching a large number of people. Last year about 7,500 people, including producers, shippers, railroad men, warehouse men, food inspectors, health officers, educators, and consumers, were interviewed, and 137 packing houses which are handling eggs and poultry visited.

A field branch has been maintained in Tennessee for more than a year, during which time, in Kentucky and Tennessee, the number of packing houses equipped with mechanical refrigeration, without which it is impossible to handle poultry and eggs well, has increased from 2 to 6, and the tonnage from 48 to 160, and a number of additional plants are being seriously planned, with a consequent increase in tonnage. The poultry and eggs shipped from the up-to-date houses using improved methods have lost the name of "southern" and are in demand in northern markets, where they command good prices. It is also possible and profitable for these houses to ship to the North the entire year instead of allowing the eggs to rot on the farms and the poultry to accumulate, because the hot season is of long duration and the decay very heavy.

During the year a traveling refrigerator has been made by the installation of mechanical refrigeration in a refrigerator car. This permits the taking of improved methods into rural districts, where it is otherwise impossible to convince the people what good handling, combined with refrigeration, can do for their produce.

Information has been given the consumer to aid him in his purchase of good and economical food; as, for example, the facts concerning the loss and deterioration of poultry when chilled in water and

shipped in ice. Every 20,000 pounds of dressed poultry absorbs on an average 1,300 pounds of water, and about 300 pounds of the most nutritious and appetizing food material of the flesh of the birds is dissolved out and goes down the sewer. The keeping time of "wet packed" birds is also much shorter than that of "dry packed," hence the waste from decay is much greater.

A preliminary statement of the work accomplished in the investigation of the handling of frozen and dried eggs has already gone to press. Cooperative work was carried on with six egg-breaking plants during the summer of 1911. The fundamental principles of good handling and sanitary requirements were worked out. For the egg-breaking season of 1912, four establishments were equipped to handle eggs in accordance with the new principles. The improved quality of the products has demonstrated that, so handled, frozen and dried eggs are not only wholesome, but a desirable addition to our food supplies; and, further, they preserve for use a large amount of one of our most nutritious foods which would otherwise be lost to the people. The investigation has also demonstrated most forcibly that research work, carried on cooperatively with the industries handling perishable products, can within a short space of time revolutionize the quality of a food product and conserve for the people much food material that would, without such cooperative investigation, be absolutely lost.

CANNING OF FOODS.

The work now in progress involves a detailed study of the canning and preserving of fruits. A special laboratory has been so equipped that it constitutes a miniature canning and preserving factory, with a bacteriological laboratory attached for the study of the organisms normally present in the fresh and decayed products.

An attempt has been made to stop the practice of partially filling the cans with food and adding a sufficient amount of water to fill to the required content. The study of the action of tin on canned foods has been continued and the results published.

FRUIT PRODUCTS.

During the past year the Bureau of Chemistry has installed at Los Angeles, Cal., an experimental plant known as the Citrus By-products Laboratory, which, during the coming winter and spring, will be used in testing out methods for the utilization of citrus by-products. Laboratory work gives every indication that citric acid, oils of lemon and orange, sterilized and concentrated orange and lemon juice can be produced from the cull lemons and oranges, now a waste product. In the work on the processing of Japanese persimmons it has been found that all varieties can be satisfactorily processed on a large

scale by keeping them in carbon dioxid for a time varying with the variety and the temperature. A study on a small laboratory scale has been made of the drying of fruits in vacuum, together with an absorbent for water vapor, such as unslaked lime. The fruits which have been examined for the identification of their acids in order to determine the changes of composition during their manufacture into fruit products included many varieties of apples, pears, strawberries, raspberries, blackberries, cherries, currants, gooseberries, quinces, huckleberries, apricots, and peaches. The shipping of fresh raspberries and blueberries from New Brunswick and Prince Edward Island to Boston by boat, so that they reach the factories in a badly fermented state, has been investigated and conditions improved in some cases where the factories have been moved to the Maine border. The work of the Enological Section has included studies on the composition of the ripe fruit of grapes, of the fruit of grapes during ripening, of grape juice, and of the fruit of apples. Studies with yeast organisms comprised incubation studies to determine the fermenting power at low temperature.

SUGAR AND SUGAR PRODUCTS.

The investigation of the maple products industry of the United States has been continued with special study of the effect of metals on the appearance and composition of the sirup, the changes in composition of maple sugar and sirup in storage, and the effect of manufacture from sour sap. Analyses have been made of cane sirup, various grades of cane molasses, and sorghum sirup to note the chemical means of differentiating these sirups from one another. About 1,120 samples were received for analysis during the year, some requiring only single determinations, but many complete examinations.

DAIRY PRODUCTS.

The greater part of the work on dairy products during the year was on evaporated, condensed, fresh, and dry milks, cheese, and butter. Milk campaigns were carried on at Providence, R. I., Cincinnati, St. Louis, and Philadelphia to determine the character of the interstate milk shipped to those cities. It is believed that this work has been of great assistance to the local authorities in their campaigns for a satisfactory milk supply.

MICROCHEMICAL STUDIES.

As a result of the field work and the enforcement of the food and drugs act regarding certain tomato products, notably pulp and ketchup, almost revolutionary changes have been taking place within the last few years in the methods of their manufacture. A large

number of manufacturers have changed or are remodeling their plants to meet the demands for a clean, sound product. The old methods have been largely abandoned, as they proved wasteful and deleterious to the product.

An investigation concerning the coloring and facing of teas was undertaken at the request of the Treasury Department. This investigation resulted in the devising of a new method for this determination, which, with slight modifications, has been adopted as the official method of the Treasury Department to be used by the tea testers of that department.

In the line of routine work, 1,298 interstate samples and 3,066 miscellaneous samples have been examined; these included spices, fruit products, dried fruits, cattle foods, eggs, nuts, sausage, mince meats, olives, candies, chocolate, cocoa products, teas, coffees, infant and invalid foods, and textiles.

PLANT PHYSIOLOGICAL CHEMISTRY.

The past year's work of the Plant Physiological Section has included investigations on starch and starch products, potato drying, graham flour, canning tomatoes, and baking powders containing small amounts of calcium sulphate. The special work comprised investigations in bread making and macaroni manufacture and also baking tests with flavoring extracts and with various egg products.

SPECIAL INVESTIGATIONS.

The study of the presence of arsenic in shellac and gelatin and other foods has been continued. A prominent feature of the vinegar work has been the determination of formic acid in vinegar adulterated with acetic acid made from pyroligneous acid. In cooperation with the various health authorities of several States, much good work has been accomplished by joint investigation and examination of the waters, oysters, and clams from various beds. As a result, many oyster sections which have shown pollution have been closed by State authorities as a source of edible oysters.

DRUG INVESTIGATIONS.

The Drug Division has been engaged in studying the composition, adulteration, and misbranding of drugs and chemicals, including those products imported into the United States or shipped in interstate commerce and found on our markets. Color reactions for the purity of asafetida have been established, as well as a quantitative constant in the lead number of the purified resin. The same reactions were carried out on the well-known adulterants of asafetida. Attention has been given to the estimation of morphin, showing that morphin sulphate used in hypodermic tablets is usually adulter-

ated with codein. The caffein investigations have been continued with special reference to certain factors modifying toxicity, such as starvation, variation of temperature, and fatigue. The action of caffein on the circulation, with special note of the drugs modifying its effect, has been studied extensively.

The total number of samples examined during the year is 1,544, of which 294 were of synthetic products, 49 of essential oils, and 392 of chemical reagents.

INSPECTION OF FOOD AND DRUGS.

More than 10,000 official samples of foods and drugs were collected by the inspecting force of the bureau during the past year. Approximately 1,500 factory inspections were made to secure information on the sanitary conditions of the establishments and the general practices as they affect the enforcement of the food and drugs act. The samples were referred to the inspection laboratories in Washington and the 22 branch laboratories in different sections of the country, where analyses were made to learn whether the products were being sold in compliance with the law.

In addition to the original analyses made for inspection or investigation work, check analyses were made and cases were prepared for the consideration of the Board of Food and Drug Inspection in the Washington laboratories of the bureau. The Drug-Inspection Laboratory reported 809 samples examined, of which 604 were domestic products. Of these, 132 (22 per cent) were found to be either adulterated or misbranded or both. The Food-Inspection Laboratory reported the study of approximately 5,000 analytical reports of domestic samples, most of which were by the branch laboratories. In 2,034 instances the reports showed violations of the law, and cases were prepared for the consideration of the Board of Food and Drug Inspection. About 7,800 analytical reports on the import food cases were considered, in addition to 741 special cases, 558 of which were reported to the Treasury Department as representing adulteration or misbranding under the act and 183 were recommended to the Secretary of Agriculture for release.

Other executive work in connection with the food and drugs act is the distribution of check samples, the receiving and recording of food samples sent to Washington, and the care of seeing that the proper exhibits are sent to the United States attorney concerned in each of the cases reported for prosecution.

WATERS.

Mineral and table waters as found at source and as they appear on the market have been examined. As a result of the examination of 202 interstate samples of water, 18 were reported to the Board of

Food and Drug Inspection as adulterated, and 2 seizures were made. Of 43 import samples 8 were found to be adulterated or misbranded and their exclusion recommended. A study of the mineral springs of the United States at source has been continued, and information covering the springs of New York, New Jersey, and Pennsylvania has been made ready for publication. This is the first attempt that has ever been made to make a systematic investigation of American mineral springs. The results will be of the greatest value to physicians, users of various waters, chemists, and those engaged in the enforcement of the national food and drugs act or State laws of a similar character. A study of methods of determining lithium in mineral waters has been completed and the results published, which will be invaluable to water analysts and those engaged in enforcing food laws. Special investigations have been made of the pollution of the Potomac River and the effect of such pollution on oysters and other shellfish. More extended work must be performed along this line before the results are ready for publication.

INSECTICIDES AND FUNGICIDES.

The chemical work on insecticides and fungicides has included studies of the composition and methods of manufacture of these products, as well as the effect they have upon the foliage, with the idea of increasing their efficacy, suggesting methods of avoiding injury to fruit and foliage, and suggesting to the farmer or fruit grower how to prepare such products where this is practicable. Such studies as these have resulted in and will result in a great saving to the farming community, both in the initial cost of insecticides and fungicides and in the saving from using insecticides and fungicides which will not burn vegetation. During the year 293 domestic samples of insecticides and fungicides (other than cattle dips and closely allied preparations) and 25 foreign or import samples have been examined under the provisions of the insecticide act of 1910. This act was designed to prevent the misbranding and adulteration of such goods, and its good effects can already be seen by users of these commodities. Of the 293 domestic samples examined, 131 were reported to the Insecticide and Fungicide Board as adulterated or misbranded, and of the 25 foreign samples 14 were recommended for detention at the port of entry. Considerable attention has been devoted to improved and new methods for examining insecticides and fungicides, and in consequence of this work not only have the methods of examining various miscellaneous insecticides and fungicides been worked out, but methods for examining such standard preparations as lime-sulphur, Bordeaux mixture, and Bordeaux lead arsenate paste have been materially improved. An investigation relative to the

toxic effect on fruit trees of certain elements, notably copper and arsenic, which may accumulate in the soil as the result of using compounds containing these substances as sprays, has been under way for the past two years and is now practically completed and the results are ready for collation and publication. The results of this work will be of the greatest value to fruit growers and agriculturists in determining whether or not permanent injury to vegetation through the medium of the soil is to be feared from repeated application of poisonous insecticides and fungicides.

CATTLE FOODS AND GRAINS.

Five hundred and four samples of cattle foods and grains were examined in the course of the year in connection with the enforcement of the food and drugs act. Of these, 89 were reported to the Board of Food and Drug Inspection as adulterated or misbranded. The work on cattle foods and grains has also included the examination of various samples for the solving of such economic problems as the feeding value of forage and range crops and improved methods of handling corn after harvesting.

LEATHER, PAPER, ROSIN, AND TURPENTINE.

Work has been done on bookbinding, carriage, automobile, and furniture leathers showing that the same harmful practices prevalent in the tanning of sole and other heavy leathers exist among the producers of these leathers. Experiments have been continued on the utilization of waste long-leaf pine for making paper and the recovery of wood turpentine, rosin oils, and wood creosote. Standard, nonfading type samples of rosin have been devised and are expected to promote the correct grading of rosin and at the same time to prove more economical to the official graders. The work on production of wood turpentine, its refining, its value as a paint and varnish thinner, and its effect on the workmen using it in paints has been continued, and the information thus obtained will be used in new experiments.

EXAMINATION OF CONTRACT SUPPLIES.

The investigations of rubber goods and paint materials have been continued with good results. Attention has been given to platinum laboratory utensils and enamel-ware cooking utensils. Improved methods have been devised for testing inks and typewriter ribbons. The samples examined for other departments of the Government during the year number 2,442, in addition to 1,800 pieces of apparatus examined for the Bureau of Chemistry.

FOREST SERVICE.

The work of the Forest Service is, of course, both investigative and administrative. The investigative work has for its field the discovery of the best methods of handling woodlands and the best methods of utilizing their products. The administrative work is that involved in protecting and developing the National Forests and in cooperating with States for fire protection of the watersheds of navigable streams under the Weeks law. While the investigative work is fundamental for the application of right methods on the National Forests as well as elsewhere, the strictly administrative work takes the lead by far in importance, as measured by volume and cost.

In my report last year I set forth in some detail the necessity of basing the administrative work on sound technical methods. It is equally necessary that the administrative policy accord with sound business principles. As use of the forests develops, certain questions of business policy are sure to come to the fore. With nearly eight years of National Forest administration behind me—years which in sober truth deserve to be called epoch-making, for within their compass a complete system of regulated use giving permanence to vast resources has been developed almost from nothing — and bearing in mind the years ahead in which that system will be tested by its results, I may well call attention at this time to the principles which underlie the present business policy and to the reasons why that policy should, in my judgment, be continued.

The National Forests contain about one-fifth of the standing timber of the country, but furnish only about one-eightieth of the annual cut. They produce by growth more than 10 times the amount of timber which is now being taken from them each year. While the forests of the country as a whole are being greatly overcut, so that our timber capital is diminishing yearly and rapidly, the National Forests are rising reservoirs of supply. The forests of the East and South particularly are subjected to an accelerating drain by the heavy demands of the general market, and to the extent that the weight of this overdemand can be relieved through the use of a greater proportion of western timber, the best permanent interests of the country will be promoted. A large part of the present stand of National Forest timber is ripe for the ax, so that the sooner it is cut the greater will be the production of new timber by growth and the less the waste through decay. All these facts point to the conclusion that the cut from the forests should be increased by every possible means.

This conclusion, however, can not be accepted unqualifiedly. There are considerations of public policy which weigh on the other side. I should have failed in my duty if I had made volume of cut my sole

object. Leaving entirely out of account the need for imposing conditions which will secure the production of the best new timber crop, it is necessary to regulate cutting with a view to the protection of the best interests of the public in the long run. Lumber is one of the things the price of which enters into the cost of living—and more largely, perhaps, than is generally realized. That cost should be kept down; but the cost of living to-morrow must not be lost sight of in dealing with the problem of the cost to-day.

Our economic dependence upon the forest is complete. Nothing is more certain than that national foresight must be employed in conserving the supplies that we have left. This is a fundamental part of the policy now in force on the National Forests. First consideration is always given to local needs. These are supplied partly under the provisions for free use of timber by settlers, prospectors, and others, partly through sales. The annual requirements of the localities in the vicinity of the National Forests at the present time may be put roughly at about 300,000,000 board feet under sales and 140,000,000 feet under free use. The amount which could be cut each year without exceeding the annual production by growth is over 6,000,000,000 feet. Most of this is therefore available as a surplus over local needs for the supply of the general market. But it is not an evenly distributed surplus. Some of the forests have no surplus at all; every foot of timber that they can supply as a sustained yield will be needed for the support of local industries now in sight. On such forests, and on forests approaching this condition, no sales whatever to supply the general market would receive consideration from me for an instant. Thus, for example, all the timber on the Deerlodge Forest, in Montana, is reserved to supply the mines at Butte. Other forests are now producing timber in enormous excess over local needs. The Cascade National Forest, in Oregon, adds through growth 200,000,000 feet a year to the available supply, while local needs now call for only about 1,000,000 feet a year. From such forests (and they are many) the general market can draw heavily without endangering local industries.

Provision is made for disposing of timber in three ways. To bona fide settlers, miners, residents, and prospectors I am authorized to allow the use of timber for domestic purposes without charge. If I sell timber to homesteaders and settlers for their domestic use, I am required to do so at actual cost. In other sales I am required to sell at not less than the appraised value, and if the sale exceeds $100, only after public advertisement for at least 30 days.

In other words, the law now recognizes that timber from the forests should be made to contribute to the development of the country by home builders, and to the development of mineral resources by

prospectors and miners, without the requirement of payment when payment may not reasonably be expected; that if the home builder buys for his own use, the Government should seek reimbursement of expenses, not profit; but that otherwise the Government should obtain the market value of the timber, and should seek to have that value fixed by competition unless the amount involved is too inconsiderable to make the procedure involved worth while.

When National Forest timber is sold it is the duty of the Government to protect the public against monopoly. To secure a monopoly profit there must be such control of a particular market as will enable those having the control to charge an unfair price. From the beginning the Forest Service methods of selling timber have been devised with a view to preventing timber monopoly by purchasers. A fair operating profit to the purchaser in his investment is permitted, but no more. Through stumpage appraisal a minimum price is fixed, below which the timber will not be sold. This price is based on a close estimate of the cost of manufacture and the market price of the product. The sale is then advertised, and competition is sought through publicity. In advertising for bids the right is reserved to reject any bids acceptance of which would tend to establish monopoly conditions. Wherever opportunity offers, sales are made to competing firms. If it appears that monopoly control might take place through business affiliations of apparently independent operators, a certified statement of the relation of an applicant or bidder to other purchasers, or a certified statement of the membership of firms or lists of stockholders in corporations, may be required. Bids from lumber companies which have large holdings of their own may be rejected in order to give preference to companies not so supplied, and companies which are operating under one sale may be refused another sale until the first is completed. Thus by the exercise of administrative discretion in the acceptance of bids and in the location of sales a regulative principle is applied to that part of the lumber industry which utilizes National Forest supplies.

The necessity for careful provision against monopoly has become more conspicuous during the past year because of the larger bodies of timber which are now being offered for sale, with proportionately longer cutting periods. In my report for 1911 I made mention of the fact that three sales had been advertised on terms which would permit the cutting to extend over from 7 to 10 years. Such sales offer the only means by which lumbering can be extended into many districts where cutting should begin at once. Immense bodies of mature timber which should be harvested to prevent deterioration and to make room for new growth are unmarketable for lack of means of transportation. Usually railroad development is the recourse for lumbering them. Naturally no one will undertake to

build from 30 to 100 miles of railroad into a mountainous wilderness without assurance of tonnage for a considerable term of years. To meet this situation a large-sales policy has been worked out. It includes provision for periodic readjustments of stumpage prices, based on the changes which take place in lumber prices in the markets where the timber is sold. The result of such sales is to secure railroad development, opening the way to general economic development, in entirely new fields; to make available for early use timber, much of which would otherwise rot in the woods; and to tap additional supplies of timber which can be sold to other purchasers once the means of getting it to market has been created.

The first necessity in making such sales is that the transportation facilities developed shall be public. This is always made a part of the contract. Railroads constructed for the operation must become common carriers. Taken with the other safeguards against monopoly already described, the stipulations on this point are fully adequate to protect the interests of consumers. Two sales of this character were concluded during the year, and a score are now pending. While it is not to be expected that all of these will be put through, a large increase in the annual cut is practically assured through the adoption of the large-sales policy.

This policy in no sense supersedes that which seeks to encourage small sales. On the contrary, it not only supplements that policy but also extends the opportunity for its application. The small mill, sawing for local supply, will enter the territory opened up by the large operation as population flows in and trade, industry, and agriculture develop. Out of a total of 5,772 separate sales made last year, 5,557 were for amounts under $500.

The general principles which guide the timber-sale business as a whole, therefore, are three:

(1) Except for sales to settlers and homesteaders who want the timber for their own domestic use, the actual market value of the timber as it stands is secured.

(2) Artificially high prices to the consumer through monopolistic control of local markets are carefully guarded against.

(3) The field of lumbering operations and the volume of cut are being enlarged wherever an opportunity exists, and new opportunities are being sought; except that the cut is not allowed to exceed the sustained annual yield, nor are sales for the general market allowed on forests where the local demand will utilize all the timber that the forest can steadily produce.

Pressure will undoubtedly be brought to bear increasingly as time goes on and market prices go up for sales on some other basis than that of the actual value of the timber. It will doubtless be said, as it has been said already, that the Government by withdrawing the

National Forests from private acquisition has reduced the amount of timber on the market and so increased the cost of lumber, and that by making purchasers pay the full value of what they buy it has levied on the necessities of the public. I have tried to point out that, far from being withdrawn from the market, the timber of the National Forests is being pushed upon the market. Ten times the quantity sold last year would have been sold if purchasers could have been found. By withdrawing the forests from private acquisition the Government has increased the amount of timber on the market, for it prevented the absorption of their finest stands by the speculators who now hold for the rise enormous quantities of the best timber in the West. By making purchasers pay the full value of what they buy the Government has simply done justice to all instead of permitting a favored few to profit at the expense of the many. While it has been collecting the actual worth of all timber sold, the Government has been doing everything that it has power to do legitimately to keep prices down by offering as much timber as possible for sale and by regulating sales to prevent the collection of a monopoly toll from the public. Any proposal looking to the sale of timber at prices below its actual market value will require to receive the closest scrutiny to discover who will in point of fact be its actual beneficiaries, and at whose expense.

AGRICULTURAL LANDS IN THE FORESTS.

While the National Forests comprise the great mountain regions of the West and in general have neither the climate nor the soil nor the topography that would make cultivation possible, there are exceptional localities and many scattered patches of land which are adapted to tillage. As originally proclaimed, the forest boundaries included much more land of this character than they do now. Naturally the lower-lying parts of the forests were the parts in which such lands were generally found. The early work of examining lands which were under consideration for National Forests was necessarily hasty, for a small force had to cover a great territory in the shortest possible time if the forests were to be saved to the public. In consequence the lines were drawn somewhat roughly. In places they took in too little land, elsewhere too much.

A revision of all boundaries, based on careful examinations and land classification, has been under way for three years and has resulted in the elimination of about 10,000,000 acres which were found not to be chiefly valuable for forest purposes. In making these eliminations an effort has been made to exclude all important nontimbered areas chiefly valuable for agriculture and located along the borders of the forests or running back from the borders into the forests. Many deep indentations which the maps now show indicate where

valley lands extending for miles up the course of a stream have been thus excluded. The result has been to reduce largely the amount of agricultural lands in the forests.

To a large extent fertile and relatively low-lying land included in the forests had, previously to their establishment, been taken up. This is true both of heavily timbered valleys and of open lands. The traveler passing up a valley and knowing that he is within the Forest boundary is often misled by what he sees. The land which appears to be withdrawn from agricultural development through reservation by the Government is very likely owned by a timber company or speculator. If the value of the standing timber on such land is much greater than its value for farming in its uncleared state, it is practically certain to be held primarily for its timber. Agricultural development of such land is effectively blocked not because the land is in a National Forest, but because it pays the private owner best to leave it uncleared until he can realize on the timber to good advantage. Many quarter sections of such land have on them timber worth over $20,000.

Thus a large part of the land still left in the forests which could be cultivated successfully is accounted for. It has passed into private ownership. In spite of the fact that, in redrawing the boundaries, areas on which most of the land was alienated were so far as practicable eliminated, there are still some 22,000,000 acres of the forests which the Government does not own. Of that which the Government does own, not over 4,000,000 acres is agricultural. Of this amount a large percentage is heavily timbered. Such lands are at present not being opened to settlement, because to open them would be simply to turn them over to timber speculators. To prevent an indefinite tying up of the land because of its timber value, I shall first, and as soon as possible, sell off the timber on them, and then list them for the benefit of the bona fide homesteader.

That there was need for provision for opening lands capable of serving their best use through agriculture I early recognized. This department advocated the enactment of a law to make this possible. The necessary legislation was secured in the act of June 11, 1906. Under the terms of that act I was authorized to list for homestead entry, upon application or otherwise, lands found upon examination to be more valuable for agriculture than for forest purposes.

Since this act was passed I have listed nearly 1,250,000 acres of agricultural land. At the outset it was impracticable to do more than examine lands for which applications were made. As time passed, however, it became apparent that a systematic segregation of the larger tracts was called for. This was first undertaken in the boundary readjustments already described, and in some special classification work, particularly in northern Montana. Following com-

pletion of the field work on the boundaries, plans were formulated for a thoroughgoing classification of areas which that work had not reached.

Agricultural development within the forests is highly desirable not only because it carries out the fundamental principle of putting every kind of land to its most productive use but also because the administration of the forests is made easier by the presence of settlers. A forest put to work is a very different thing from a wilderness. The more people it has living in it the better. They are needed to use the resources. They are also needed to help protect the forests. Settlers assist in locating fires and in putting them out. They are available for extra help in the construction of improvements and similar work. Their farms become to a certain extent bases of supply. In its plans of organized fire protection the Forest Service now arranges with settlers to take a definite part in the work, and thus forms what may be called the secondary line of defense. There is every reason why the settlement of lands more valuable for agricultural use than for forest use should be welcomed and facilitated.

A comprehensive plan of land-classification work for the general determination of agricultural lands within the forests received my approval in April of the present year. Under this plan the land will be classified on the basis of full data with regard to all important factors. Questions relating to soil will be passed upon by specialists from the Bureau of Soils. In fact, a complete scientific determination will be made not only of the relative value of the land for field crops and for forest crops, but also of the relative value of different areas for farming, and of the kind of farming that will be most successful. To this work the entire department will contribute. The applicant for land will be able to learn not merely that he may settle in a certain place, but the relative value of all lands open and the crops and cultural methods which will utilize to best advantage any specific area. In this way I believe that the principle of putting every kind of land to its best use will be carried out more effectively than has ever been possible before and with greatest benefit to those who seek to make settlement in the forests.

Partial provision for this work was made by an appropriation of $25,000. To carry the work forward on the scale planned much more liberal provision for it should be made, and I strongly urge that the appropriation be increased.

In listing tracts for settlement a difficulty which is of serious importance in some cases is created by the need to reserve rights of way over the land. In narrow valleys a single farm may bottle up a large and valuable body of timber if no right of way exists across it, or it may block entrance to agricultural land lying beyond. When the need of a right of way can be foreseen it is now surveyed out

in advance and described in the patent; this, however, is both costly and unsatisfactory, for it can not always be told where the right of way should run. Authority should be given to the Secretary of the Interior to express in the patent the reservation of rights of way for governmental purposes and to meet the needs of settlers.

WORK OF THE YEAR.

With field enlarged by the extension of the work under the Weeks law, providing for the acquisition by the Federal Government of forested lands on the watersheds of navigable streams, and with a material gain in efficiency and increase in output in old lines of work, the total cost of all Forest Service activities was lowered from a little over $5,900,000 in the fiscal year 1911 to about $5,530,000 in 1912. The 1911 expenditures, however, included the heavy disbursements necessitated by the great forest fires in the fall of 1910. Notwithstanding this fact it is beyond question that the Forest Service got last year larger and better results for every dollar expended than ever before. This is due to the constant study of efficiency in organization and improvement of the administrative mechanism.

The work of readjusting the National Forest boundaries was continued, with the result that during the year a net reduction in the total area of the forests was effected, amounting to something over 3,000,000 acres.

In States in which it is still possible to add to the forests new areas which should be included, the boundary readjustments added last year not quite 250,000 acres. To the six States (Washington, Oregon, Idaho, Montana, Wyoming, and Colorado) in which additions to the forests by presidential proclamations are forbidden Congress added, near the close of the last session, California. The gross area of all forests at the close of the year was about 187,500,000 acres and the net area about 165,000,000 acres.

To consolidate the National Forest holdings and to provide for satisfaction of the equity of States having unsurveyed school lands within the forests, agreements providing for an exchange with the States of South Dakota and Idaho of such school lands for other lands of equivalent acreage and value, lying in solid blocks along and within the boundaries of the forests, were entered into. The agreement with South Dakota affects about 60,000 acres. Surveys to determine the area which Idaho will exchange were under way at the close of the year. Other exchanges affecting both State and private lands are pending. Legislation to permit this policy to be applied more broadly is needed.

Cooperation with the Department of the Interior through reports on mining claims within National Forests when patent is sought was continued. These examinations are the only means of protection

which the Government has against fraudulent acquisition of National Forest lands sought under the guise of mining claims for water-power sites, timber speculation, range monopoly, and other purposes. In making them, careful provision is made to safeguard all the rights of claimants, and no unfair or burdensome restrictions are imposed on the mining industry. Unfavorable reports on claims are made only after examination by fully qualified mineral examiners and practical mining men. Reports to the General Land Office on all kinds of unpatented claims covered 1,869 such claims, of which 1,534, or 82 per cent, were reported on favorably.

Receipts from the National Forests increased over $140,000, or about 7 per cent. The major part of this increase was from the receipts from timber sales. A much more active demand for timber was apparent during the year and resulted in large sales which make certain a very large increase in future receipts from this source.

The total receipts from all sources were over $2,100,000. Twenty-five per cent of this amount goes to the States in which the forests are located, as county, school, and road funds, and an additional 10 per cent of the receipts of last year were made available by Congress for expenditure in the States within which the receipts were obtained, for the construction of roads and trails within National Forests. These roads and trails will be primarily for the benefit of communities, and cooperation with communities will be sought in carrying out the work. At the same time the development of the forests will be to some extent aided through the additional facilities furnished. I consider this a wise and beneficial expenditure, and I recommend that the appropriation be renewed.

PROGRESS IN FOREST MANAGEMENT.

The total stand of timber on the National Forests, including Alaska, is now the equivalent of nearly 600 billion feet. Plans for thorough protection of this timber against destruction by fire and for the development of the forests to permit the harvesting of the mature timber, and studies of methods by the application of which the highest productivity will be assured and a constant yield provided for, were materially advanced. The progress made in constructive application of the principles of forestry, in the interest of the best public welfare, to the enormous area and widely varying conditions of the National Forests has been immense. Considering the brief time since the application of forestry by the Government began, an accomplishment quite without parallel in any other country has been achieved. How great the public service which has been rendered is, it is almost impossible to realize. Its character is fundamental, for it has established a firm and safe basis on which will be reared the future system of intensive use.

FOREST FIRE LOSSES OF THE YEAR.

Not quite 2 acres per thousand were burned over during the calendar year 1911. On only a very small part of the area burned over was any considerable percentage of the merchantable timber destroyed. The estimated damage was about $355,000, nearly equally divided between damage to timber and damage to reproduction and with a small loss of forage value.

During the last half of the fiscal year 1912 very few fires occurred. This was partly because of unusual weather conditions, partly because of the great gain in efficiency of protection and the development of the system of roads, trails, telephones, lookouts, and other permanent improvements. Much still remains to be done and large expenditures must be made before the forests will be safe against disastrous fires; and the present protective force is far too small. The saving of public property, to say nothing of the protection given to private property and to life which follows from efficient fire protection, makes failure to provide for such protection not merely most short-sighted economy but an almost criminal neglect. Better manned and better equipped forests are a matter of primary importance. The advance in the development of an enlightened and vigorous public sentiment on the subject of forest fires and in organized protection of private holdings in National Forest regions has been a prime factor in lowering the fire risk and is a matter of great importance. That this advance has taken place is due first of all to the example furnished by the Forest Service and to the education of public sentiment which it has brought about. An adverse influence has been temporarily created in localized regions, particularly in northern California, by the agitation of the theory of "light burning." This has brought about an increase in incendiarism in certain localities, due not to malice but to the mistaken idea that forest protection is promoted by letting fires run over the ground frequently. This would mean in the long run forest destruction, for it prevents the renewal of the forest growth.

REFORESTATION.

Both through seeding and through the planting of young stock grown in the National Forest nurseries the work of reforestation was pushed. Under the plans which I have approved an average of 30,000 acres will be covered each year, the amount varying, however, to fit such special conditions as may present themselves. In years of unusually heavy seed crops, for example, the seed gathering will be put ahead of the sowing and planting work. About 20,000 acres was covered last year, of which about 14,000 acres was sown and 6,000 acres planted at a total cost of about $130,000. Work on a

large scale is now centered in the regions where climatic conditions are most favorable. Elsewhere the work is primarily experimental—to discover the methods which will permit the difficult work to be accomplished most successfully and at least cost. Facilities for gathering the seed needed for direct sowing and in the nurseries were increased and the cost of seed extraction was markedly cheapened. Nearly 50,000 pounds of clean seed were collected, at an average cost of $1.68 per pound. It was established that the best results are secured when seed from the region in which the trees are to be grown is used.

PROGRESS IN RANGE MANAGEMENT.

With a somewhat smaller area under grazing administration than in 1911, the number of animals grazing under permit was very materially increased. This is mainly the result of the improvement in range conditions which regulated grazing has brought about. Not only the range but also forest growths and waterflows have been benefited. Efforts were continued to bring into use range hitherto unutilized because inaccessible. In northeastern Washington, northern Idaho, and northwestern Montana, especially, much forage is now going to waste which better shipping facilities will make it possible to utilize; negotiations which have been undertaken with the railroads promise a favorable solution of this problem. Through the construction of improvements for the control of the movements of stock and to make water available for them, through continued study of the forage resource and of the modifications which it undergoes in the different forms of use, through determination of the kind of stock to which each part of the range is best adapted and adjusting use accordingly, and through stock protection against losses by contagious diseases, poisonous plants, and the depredations of wild animals, the work of past years was continued and extended.

Range management aims at maximum forage production, improved methods of utilizing the forage resource, and development of the stock industry along the lines most beneficial to the community. To secure from the range its largest economic returns to the stock industry in profits and to the country in meat supplies, wool, and hides, intensive methods of range utilization must be devised and adopted. Much of the foundation work for the development of such methods has now been done. With diminution both of the extent and of the carrying power of the open range, the problem of producing the beef and mutton which an increasing population must have has become serious. There is a growing tendency to remove stock from the unreserved lands to the forest ranges. The advance of settlement and the rapid appropriation of the choicest

lands and of areas which control large tracts of grazing land by individual stockmen is both diminishing the opportunity for new men to enter the stock business, and tending toward a situation in which the public will have to pay not only for the cost of production on the open range, but also for the charge which represents rising rental value. It is of no small consequence that so large a part of the range is in public control and may be used in the ways which will result in the greatest benefit to all the people.

ACQUISITION OF LANDS UNDER THE WEEKS LAW.

The work of examining lands for purchase by the National Forest Reservation Commission under the Weeks law was actively carried forward. During the year 665,000 acres were so examined, which, together with 175,000 acres examined in the fiscal year 1911, brings the total area thus far covered up to 840,000 acres. The total area in process of acquisition by purchase or condemnation at the close of the year was not quite 260,000 acres, situated in New Hampshire, Virginia, Tennessee, North Carolina, and Georgia. To prevent speculation in options it became necessary to announce during the year that no optioned lands would be considered for purchase. In order to secure title satisfactory to the United States it has proved necessary in many cases to resort to condemnation proceedings. Of the lands placed under purchase contract or condemnation proceedings during the year, part are cut over, part are more or less heavily culled, and part are virgin timberland. The prices paid ranged from $1.15 to $15 per acre, with an average of $5.95.

STATE AND PRIVATE COOPERATION.

The first place in cooperative work with States is that provided for by the appropriation of $200,000 carried by section 2 of the Weeks law, the aim of which is to secure the protection from fire of the watersheds of navigable streams. Cooperative agreements entered into with 12 States have resulted in the protection, wholly or in part, of such watersheds as the Penobscot, Kennebec, Connecticut, Merrimac, Hudson, Delaware, and Potomac in the Northeast, the Mississippi in Wisconsin and Minnesota, and the Columbia and Willamette in the Pacific Northwest. As a result of the law very great progress has been made by many States, particularly in the East, in the development of organized fire protection. There is great need for more work of this kind in the South, but few of the States there have as yet passed laws which make it possible, under the conditions which I have felt it necessary to prescribe, to enter into cooperative agreements with them. One very striking effect of the law has been to stimulate the proper care of forest resources

wherever its provisions have been applied. On the average every dollar expended by the Federal Government has resulted in the expenditure of at least $2 by the State and private owner, and I look for this ratio to increase as the benefits of protection become clearly apparent. The sum appropriated will be exhausted by the year 1914. A further appropriation to permit this work to be continued and extended into new States is, in my judgment, highly desirable.

FOREST INVESTIGATIONS.

Experimental studies conducted on the National Forests, in addition to those having to do with reforestation, yielded results which will be of the greatest usefulness in arriving at the best methods of management and protection, and in determining forest influences, the characteristics of different forest types, and the growth, volume, and yield of important tree species. The utility of these studies is, in fact, twofold; for they not only furnish the necessary scientific basis for National Forest management, but also supply knowledge indispensable for the application of forestry to private timberlands throughout the West. The principal agency for conducting such investigations is the experiment headquarters which have been established on Forests affording conditions typical of a wide region, though the work is supplemented by field studies conducted in many different localities. Two new stations were established during the year. Though none of the stations has been established more than a few years, the results already secured have been of the greatest assistance in the actual work of forest management. Leading in the work of the past year were studies of the best silvicultural systems and degrees of cutting to secure natural reproduction; the effect of forest cover on streamflow, excessive wind movement, and evaporation; the damage caused by light surface fires; the deterioration of fire-killed timber; and the growth, yield, utilization, and life history of five important western trees.

Besides the investigations conducted on the National Forests, silvicultural and other studies were carried on to obtain information applicable to the best management of woodlands in all parts of the country. Aside from their use in the particular study for which they are gathered, the data and measurements collected in the course of silvicultural studies, taken together, furnish a basis upon which it is possible to establish laws and relationships of tree growth of the greatest value to those having to do with the study or management of timberlands. Dendrological investigations included studies of the distinguishing structural characteristics of important native trees and of foreign woods for which inferior substitutes are likely to be placed upon the American market.

Studies of forest products, centered mainly at the Forest Products Laboratory at Madison, Wis., yielded important results. These, by increasing our knowledge of the saving which can be effected by the preservation of wood against decay, by indicating the possibility of utilizing for different purposes supposedly inferior but abundant species in the place of more valuable ones now becoming scarce, and by showing how greater efficiency can be had in methods of manufacture, promote forest conservation in a very important field. Studies in wood preservation have dealt with the efficiency of various preservatives, the penetrability and resistance to decay of different woods, and the best methods of injection. Wood turpentines have been studied and analyzed to arrive at the best methods of distillation and refining and to determine how their composition is influenced by different methods of production. Woods heretofore utilized little or not at all in the manufacture of paper have been tried and found suitable for certain grades. Strength tests have been made on many species of American woods. Different methods of kiln-drying lumber have been studied, and a new and more efficient type of kiln designed.

BUREAU OF SOILS.

PROGRESS OF THE SOIL SURVEY.

The work of this bureau has been vigorously prosecuted during the last year. The soil-survey work has been carried on in 80 areas, distributed through 28 States.

There have been surveyed during the year 31,304 square miles, or 20,034,560 acres, on the detail scale of 1 mile to the inch, and 149,810 square miles, or 95,878,400 acres, on the reconnoissance scale of 4 miles to the inch. The reconnoissance work has been mainly in the Great Plains region.

More and more active interest is being taken in the soil survey, and a number of the States, in addition to those which were reported last year, have started active cooperation work with the bureau, in order that the progress of the survey within their borders may be hastened for the benefit of their people.

The soil-survey work as a whole has progressed to such an extent that a very fair idea can now be drawn of the soil resources of the country, and the results are being used extensively as the basis for other lines of agricultural investigation and for the development of agricultural possibilities and resources.

During the year a revision of all the work completed to January 1, 1912, has been made. The material is at hand for a comprehensive bulletin on the soils of the United States, showing the meth-

ods used in the soil survey, the basis of the classification of the soils, and the use to which each of the soil types is best adapted.

At the same time active work is being prosecuted in the further study of some of the individual soil types and soil series that are of great national importance and in the preparation of reports giving a comprehensive view of the uses to which they are now put, and suggesting their best use in different parts of the country and under different climatic and industrial conditions. A bulletin describing the Norfolk series has already been prepared, covering the whole question of the best use of these several soils in the important special line of truck farming. A similar bulletin on the Clyde soils, typically developed around the Great Lakes, is in progress, and some preliminary work has been done on some of the other important soil series.

The reconnoissance surveys have been extended in the Great Plains, until now soil maps have been published or are in course of publication of the western half of two-thirds of North Dakota, South Dakota, Nebraska, Kansas, the Panhandle of Texas, and a large area in south Texas, giving an almost continuous strip from Canada to Mexico.

While these maps are on a scale of 4 miles to the inch, it is believed that for many years to come they will serve the purpose of aiding in the agricultural development in this sparsely settled region, where the soils are uniform over large areas and where for this reason greater detail of mapping is not absolutely essential.

Several of the most experienced men in the soil-survey work have been detailed to assist the Bureau of Forestry in the examination of the soils of the National Forests and to pass upon their agricultural value for the information and guidance of the Forest Service in carrying out the law regarding the elimination of agricultural lands from forest reserves. As this work must develop to large proportions in the immediate future, I have included in my estimates an increase of $20,000 for the Bureau of Soils. Only in this way may the bureau meet the increasing demands that will result from the requirements of the last appropriation act for this department.

SOIL CHEMISTRY.

Work has continued during the year on the fundamental and thorough investigation of the composition of important soil types, determining both the mineral components of the soil and all of the elements, including the rare elements that have heretofore been overlooked in the chemical analysis of soils, for the purpose of throwing more light than has heretofore been shed upon fundamental differences or similarities between the mineral parts of soils.

SOIL PHYSICS.

The physical properties of soils have long been recognized as exceedingly important in the distribution of crops and in the development of agriculture.

The relative amount of sand, silt, and clay and the way these are combined or held together has an important influence on the drainage and aeration and on the mechanical work of cultivation, and with the organic content of soils has a very important influence on the retentive power of the soil for moisture and the supply of moisture available for crops. The extent to which these physical properties can be influenced by cultivation, fertilization, and by crops themselves is being investigated as a basis for improved and efficient methods of maintaining the soil in suitable physical condition for those proper functions that are adapted to the needs of our staple or special crops.

FERTILIZER INVESTIGATIONS.

The investigations along this line have shown that the United States contains ample raw materials for the production of all the standard fertilizing materials that it now demands.

The groves of giant kelp along the Pacific coast of Mexico, the United States, and Alaska have been found to contain a vast supply of potash salts which can be recovered for agricultural use; and if these kelps are properly protected and the plants are allowed to grow and function normally, the segregation of potash salts from the sea water continues and, by harvesting from time to time, a continual supply of potash can be maintained.

The mechanical difficulties in the cutting and harvesting of the material are now being taken up by commercial firms in a way that makes it seem probable that adequate methods may be devised to utilize this source for the production of sufficient potash for the country's needs.

In the meantime, an unremitting search has been maintained for possible surface deposits of potash salts in some of the desert basins. Theoretically, it seems probable that areas may be discovered where segregation of these salts has occurred, and one such deposit, rich in potash, is now actually being exploited commercially. This is especially important since the examinations that have been made of our salt brines seem to show that there is little prospect of success along this line.

The enormous deposits of phosphate rock in this country have a tendency to induce waste and undue exploitation of high-grade rock only. From investigations now well advanced, however, it appears

that at no distant time the utilization of low-grade rock may be looked for on a commercial scale.

The investigations into the possible sources of supply of nitrogen have been sufficient to indicate that if future developments make it necessary the United States can supply its requirements of this expensive material.

SOIL-WATER INVESTIGATIONS.

In my first report to the President, made nearly 16 years ago, I called attention to the fact that rainfall was of little benefit to crops until it had entered the soil, and from there on the benefit was proportional to the ability of the soil to retard and regulate its flow toward the sea. The whole question, therefore, of the utilization of the rainfall in agriculture depends first upon the amount of water which enters the soil and next upon its movement within the soil.

During the last year a very exhaustive study has been made of the depth of free-flowing ground water under the surface of the soil in all parts of the United States, and somewhat as to the movement of this ground water, which has been found in some instances to extend over hundreds of miles between the source of supply and the discharge into the sea.

Having determined the fundamental position of the free water in the soil, it remains to study more intensively than has been possible heretofore the distribution of the water between the ground water and the surface of the land, as well as the effect of cultural methods in properly regulating the supply available for crops. It is believed that methods are now available by which this important but very intricate problem can be worked out.

SOIL-FERTILITY INVESTIGATIONS.

Thirty-five to forty definite organic chemical compounds have been separated from the humus portion of the soil, and a number of these were discovered in the last year.

Sufficient is known of the subject now to indicate that the soil has certain functional activities and that organic matter is digested in the soil, through the agencies of bacteria, enzyms, fungi, insects, and more purely chemical agencies in a manner similar to the processes of digestion in living organisms. The presence of certain organic bodies in the soil indicates that the functional activities of the soil are proceeding in such a way as to make the conditions beneficial or harmful for any particular plant or crop.

It has been found, furthermore, that through methods of cultivation, of fertilization, and of crop rotation the functional activities of the soil may be controlled within limits so as to put the soil in

better condition for crops than it formerly was, or to maintain it in such conditions of functional activity as to exact from the soil a larger crop and a better condition in the soil for succeeding crops.

The problem of soil fertility is thus shown to be exceedingly complex, but its very complexity makes it appear hopeful that we will ultimately reach the understanding of the subject that will enable us to handle intelligently all our important soil types and so to understand their peculiarities and their particular needs as to enable the most rapid progress in the development of more intensive methods of agriculture than now prevail.

BUREAU OF ENTOMOLOGY.

Without increased appropriations by Congress, the work of this bureau has been carried on during the year along much the same lines as indicated in previous reports, and with a continually increased benefit to the agricultural interests of the country. While its efforts have been directed mainly to the search for the best methods to control the insect enemies of agriculture and horticulture, the subject of the damage to the health of live stock and to the health of man himself by the carriage of disease by insects and the subject of the insect injuries to forests have been included in the work of the bureau.

THE GIPSY MOTH AND THE BROWN-TAIL MOTH.

There was during the year comparatively slight increase in the territory infested by gipsy and brown-tail moths. The work of attempting to prevent the further spread has been continued in the way of clearing up roadsides, in the way of the inspection of all plants and plant products going out of the infested territory, by the study of the diseases of the gipsy moth, and by the continued importation and establishment of parasites and natural enemies of both species from abroad. Conditions within the infested territory continue to improve, and neither the gipsy moth nor the brown-tail moth is any longer the pest in the villages and towns of New England that it was even five years ago. In the woodlands the damage produced especially by the gipsy moth is still evident, but great progress has been made in the study of woodland conditions, and this study has apparently arrived at the point where the preservation of the forest areas in New England seems to be a decided possibility, even in the presence of the gipsy moth, and this may be brought about by a varied system of forest management, the details of which are being prepared for publication and general distribution. But one new isolated outbreak of the gipsy moth of any size was discovered during the year, and this was found at Geneva, N. Y. The State authorities, aided by the advice of the experts of the bureau, have appar-

ently radically exterminated the insect at this point, so that there is no fear of future spread from this portion of central New York.

THE ALFALFA WEEVIL.

Active work against the alfalfa weevil, which threatens widespread destruction, has been carried on with the help of added funds appropriated by Congress. More men have been added to the field force, and the insect has been carefully followed through the entire year. Not only has this work been carried on in the laboratory and in the fields adjoining the headquarters, which are at Murray, Utah, but it has been duplicated to a large extent in higher altitudes in order to obtain thorough knowledge of the insect throughout the territory over which it has become distributed. Experimental work with parasitic insects and parasitic fungi has been carried on, and several species of parasites have been imported from Europe, which is the original home of this weevil. Field experiments looking toward the combining of alfalfa with other crops, in order to reduce the intensity of the weevil attack, have been carried on in cooperation with the Bureau of Plant Industry, and mechanical field experiments have been made upon a large scale. It seems now that the second and third crops of alfalfa can be grown successfully, even in the presence of the weevil, by adopting measures discovered in the course of this work, but, as the important crop is the first crop, more work remains to be done in the hope of discovering methods of obviating or greatly reducing the attack of the weevil in the early portion of the year. The insect does not seem to have spread as rapidly as was feared, but it is likely to turn up at almost any point where alfalfa is extensively grown.

WORK AGAINST FOREST INSECTS.

It is a pleasure to announce, in connection with the work against forest insects, that while a year ago great damage was threatened by the southern pine beetle in the States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas, the efforts made by the bureau resulted in such good work on the part of timber owners that the danger mark may be said to have been already passed for the present and that the enormous prospective damage has been prevented. In the course of this work there was one notable example of successful control at direct expense. In a 90,000-acre tract, where there was thousands of dollars' worth of beetle-killed timber and every indication that the damage would be even greater this past year, $373 were spent in the cutting and burning of 60 infested patches, with the result that in the spring of 1912 it was found that the spread of the insect had been practically checked and that almost no pine was being attacked.

Work of this same character has been carried on at a number of points in the West by cooperation with the State authorities, with the Forest Service of this department, and with private owners, and it has been demonstrated again and again not only that much of the loss of insect-killed timber in past years might have been prevented without any extra expenditure of funds, but also that with care and foresight in the future the work of the destructive bark beetles over nearly all of our territory can be economically controlled.

INSPECTION WORK.

I called attention in my last two annual reports to the urgent need of the passage by Congress of a plant quarantine and inspection law, showing as forcibly as possible that the United States has been the only great power without a law to protect it from insect pests and plant diseases from other countries with which it has commercial relations. Down to the close of the past fiscal year, although legislation was pending in Congress, no action had been taken, and with a view to securing as perfect inspection as possible in the countries of origin of nursery stock especially, which was bound to be imported in large quantities the coming autumn into this country from portions of Europe, the chief of the bureau was sent abroad to confer with the nurserymen and the inspection officials of those countries. Toward the close of the session of Congress within the present fiscal year, an inspection and quarantine bill was passed by Congress and a Federal Horticultural Board was established, composed of members of the Bureau of Entomology, of the Bureau of Plant Industry, and of the Forest Service. Regulations have been drawn up by this board covering the importation of products likely to carry injurious insects and disease, and certain quarantines against certain classes of products have been announced. This is a great step in advance, and it is hoped and expected that the operations of the act will serve as a marked protection against the introduction of injurious species into this country in the future. When we consider that more than one-half of the pests of this kind of first-class importance existing in this country have been in past years introduced in this way and unwittingly established in our midst, with the resultant damage of millions of dollars' worth of property, the country can at last congratulate itself upon the fact that it is in position to prevent very great prospective waste.

Inasmuch as special mention was made in a previous report of the destruction by experts of this bureau, after inspection, of a large shipment of ornamental flowering cherry trees sent as a gift from the city of Tokyo to the wife of the President, it is a pleasure to announce that among the importations of the past year which have

been inspected here in Washington there was another shipment of 3,000 ornamental flowering cherry trees sent by the city of Tokyo to replace the former shipment, and that after inspection these trees were found to be free from injurious insects, although examined individually with great care. They have been planted in the District of Columbia.

WORK ON INSECTS AFFECTING THE HEALTH OF MAN.

The investigation carried on by the Bureau of Entomology on the Rocky Mountain fever tick was completed during the year and the results published. The investigation showed that the proper treatment of certain domestic animals will probably result in the practical extermination of this disease in the infected regions.

A very interesting investigation has been begun concerning the possible relations of biting insects to the carriage of pellagra. These investigations have been carried on for the most part in the State of South Carolina in cooperation with the Postgraduate Medical School of New York City. It is well known that claims have been made by an English investigator, Sambon, working in Italy, to the effect that pellagra in that country is probably carried by the bite of a gnat of the genus *Simulium* flying from patients affected by the disease to healthy persons. The investigations which have been carried on in South Carolina, however, seem to indicate that, in this country at least, if pellagra should be shown to be carried by any biting insect, the insect concerned in this transmission in South Carolina is very much more probably the biting stable fly or biting house fly (*Stomoxys calcitrans*) than any of the resident species of the genus *Simulium*. This conclusion is especially significant in view of the recent announcement by the experts of the Harvard Medical College that they have secured experimental proof of the transfer of infantile paralysis by this same species.

WORK ON THE WHITE FLY IN FLORIDA AND ON OTHER ORANGE INSECTS.

The investigation of the white fly in Florida has made substantial progress and is nearing completion. The parasites imported from India have apparently died and have not become established in Florida, but inexpensive and effective methods of spraying have been found and are now being used and promise to settle in a satisfactory manner the problem of direct control. Demonstration work is now going on.

Work on the orange thrips being carried on in California has resulted in the finding of satisfactory spraying methods, and, after demonstration on a large scale, these methods have been adopted by the orange growers.

Further investigations have been begun with a view of still further cheapening the hydrocyanic-acid gas process for the fumigation of orange trees against scale insects in southern California. The results previously announced have brought about enormous economy in these methods, and work going on at the present time promises to cheapen them still further to a degree which will result in very great benefit to the growers.

OTHER WORK.

The Mexican cotton boll weevil has continued to spread somewhat, and has reached western Florida. Owing to the early cold weather of the autumn of 1911, certain territory in the northern range of this species was at least temporarily rid of the pest, the early freeze catching them in the larval condition. Work on the testing of control measures has been carried on in the Mississippi Yazoo delta, and the study of the parasites of the species has been continued, while attempts have been made to locally concentrate parasites from one region into another.

Work upon tobacco insects and the insects affecting sugar cane has been continued. An extensive experiment has been carried on in New Orleans in the effort to eradicate totally the sugar-cane borer which bids fair to be successful in this locality.

The Argentine ant has been shown to be most injurious to orange plantations in Louisiana and now threatens to spread to the orange groves of Florida. Measures of control so far ascertained have been reasonably successful, but it is difficult to secure their general adoption.

The work on the cotton red spider in South Carolina has indicated the food plants upon which this creature passes the winter, and a spray of potassium sulphide in water has been shown to be an economical and effective method of destroying the spider when it has invaded a field. Work with this solution can be successfully carried on at an expense of 75 cents per acre.

Large-scale spraying operations against the pear thrips have been carried on as demonstrations in California. Nearly 15,000 acres of orchards have been sprayed under the direct supervision of the bureau and with excellent results.

Field work against the onion thrips has been continued in Texas and Indiana. Good control measures have been discovered against this insect, and with widespread cooperation it is believed that the damage which it does may be largely stopped.

THE MEDITERRANEAN FRUIT FLY.

The appearance in destructive numbers of the so-called Mediterranean fruit fly in the Hawaiian Islands attracted much attention, especially from the State of California, since it was feared that the

introduction of this pest from Hawaii into the port of San Francisco would result in serious damage to the fruit crops of the Pacific coast. Funds would not permit of active operations on the part of the department against this pest prior to the close of the fiscal year, but preliminary studies were made in anticipation of an appropriation by Congress, which was granted toward the close of the session in August. The results of the work done under this appropriation will be reported next year, but it should be stated at this time that experts have been sent to Hawaii and that all aspects of the threatened danger which seemed to afford a profitable field for investigation are now being carefully studied by competent men, while, with the coperation of the Territorial government and of the State of California, actual exterminative work in the region of Honolulu is being carried on as far as possible.

BUREAU OF BIOLOGICAL SURVEY.

REARING FUR BEARERS.

There are extensive regions in the United States well adapted to fox farming and kindred industries, and the rearing of fur-bearing animals for their pelts continues to be a subject of much interest, as is shown by the many inquiries from various parts of the country asking for information on the subject. Skunks, muskrats, mink, and foxes are reared in captivity or on preserves under control of breeders. The great demand for breeding animals and the reluctance with which successful breeders part with their stock of black foxes have caused large prices to be asked for mature animals, preventing the business from becoming general, and confining the industry in the hands of a very few.

Comparatively few attempts to raise mink have been made in the United States, and but little is known on the subject. But at from $3 to $8 for first-class pelts, the present prices, which are not likely to diminish, the raising of these animals should be remunerative, especially in connection with some other established business, such as poultry raising, orcharding, or truck growing; therefore, in cooperation with the National Zoological Park, steps have been taken to experiment with these animals with a view to determining the most successful methods of rearing them.

Muskrat farming is already a prosperous business, and has probably reached its highest point of development on the Eastern Shore of Maryland, although followed in other sections of the country. Muskrat marshes are worth more, measured by the actual income from them, than cultivated farms of like acreage in the same vicinity. The marshes need only to be protected from poaching, as the muskrats feed on the roots of the reeds and marsh grass, and the

rental to the trappers is usually for half the fur, leaving the meat as an additional source of gain to them. Only one other animal in the world, the European rabbit, exceeds the muskrat in the number of skins marketed.

RODENTS IN RELATION TO AGRICULTURE.

Prairie dogs, ground squirrels, and gophers are very destructive rodents, inflicting large damage and levying a heavy tax upon the tillers of the soil; therefore the Biological Survey conducts experiments with poison baits, traps, and other methods of extermination.

The daily forage consumed by 32 adult prairie dogs equals the amount required by a sheep, and 250 eat approximately as much as a cow. The ground squirrel, though smaller, is a voracious feeder, and the gophers, comparatively small, are not abstemious. As the region infested by these pests includes a number of Rocky Mountain States, California, and other Western States, and as some of the colonies occupy many thousand acres and aggregate millions of rodents, the extent of the damage they do to forage and other farm crops can be readily comprehended.

Besides, it has been definitely ascertained by the investigations of the past two years that the spotted-fever ticks, in the two younger stages, live almost wholly on small native rodents, and that the California ground squirrel has been infected with bubonic plague by fleas from rats, hence that these dread diseases are likely to become endemic. Therefore there are two important reasons for attempting the extermination of the animals. The chief reliance for this is placed on the use of poisoned grain and other poisoned baits, but the use of traps, and, in some cases, the use of carbon bisulphid or pintsch oil in the burrows, supplements the poison. In these experiments oats have been found to be the best vehicle for carrying poison, as it is readily eaten by the rodents and rarely by birds.

THE ECONOMIC RELATIONS OF BIRDS TO FARMING.

Investigations by the bureau, in cooperation with the Bureau of Entomology, as to the relations of birds to the insect to determine what aid, if any, birds are likely to lend in checking the increase of the alfalfa weevil and retarding its spread, show that although the weevil has been established in this country only five or six years 31 species of birds have already learned to eat it. It is an interesting discovery that the English sparrow heads the list as a determined foe of the weevil, and that, if it is possible to utilize the services of the English sparrow against the formidable insect foe, the alfalfa weevil, it will be part compensation for the damage done by that bird in other sections.

76397°—Ab. 1912—vol 2——32

Birds also prey upon the boll weevil while it is hibernating, while on the cotton plants, and during its autumnal migration flights—the period when the weevil chiefly extends its range.

The Biological Survey, by making a careful analysis of the stomach contents of different species of birds, can show their relation to agriculture and horticulture, whether beneficial or injurious, and approximate the good or harm they do. The importance of this work is very great.

A Farmers' Bulletin entitled "Some Common Birds in Relation to Agriculture," which was issued many years ago, has always been in great demand, and over 500,000 copies have been distributed. In order to furnish additional literature along the same lines, two other Farmers' Bulletins on familiar species of birds have been prepared, one dealing with some common game, aquatic, and rapacious birds in relation to man, and the other treating of the common birds of forest, field, and garden.

IMPORTATIONS.

In addition to studies of native birds with the view of aiding the farmer, supervision of the importation of birds and animals in order to prevent the introduction of species which might prove injurious is by law maintained by the bureau, and 583 permits were issued and 140 consignments inspected by the regular inspectors of the Biological Survey stationed at New York, Philadelphia, and San Francisco, as compared with 519 permits and 123 inspections in 1911. Under these permits there have been imported 428,269 birds and 4,582 mammals. Of these birds there were 338,275 canaries, 15,409 pheasants, 23,181 partridges, 11,353 miscellaneous game birds, and 40,051 miscellaneous nongame birds. Besides these, 28,808 birds and 875 mammals requiring no permits were admitted to entry, making a total of 457,077 birds (including 362,604 canaries, 15,412 pheasants, 23,181 partridges, 11,493 miscellaneous game birds, 44,387 nongame birds) and 5,457 mammals. Fifty-five permits were issued at Honolulu covering the entry of 123 birds, 17 mammals, and 10 reptiles.

Among the birds were 23,181 European partridges, as compared with 36,507 in 1911. This bird has not proved as popular as it did several years ago, and has been purchased in smaller numbers by State commissions and private individuals. The importation of quail from Mexico reached 7,570, as compared with 3,110 in 1911 and 1,246 in 1910. This number might have been much larger but for the suspension in the issue of permits early in February, owing to an outbreak of the highly infectious quail disease in the Southwest and the practical cessation of all interstate shipments of quail after that date. Among the rarer waterfowl were some 250 Formosan teal. These birds were first imported into the United States in 1909, but the number brought in during the past fiscal year considerably ex-

ceeds that of preceding years. Interesting, also, was a shipment of 16 California Valley quail, imported from Austria. These birds, like wood ducks and other native species, have been sent abroad, where they are raised in captivity and are now being reimported.

Among the miscellaneous nongame birds was one Imperial Amazon parrot, imported from Dominica for the New York Zoological Park. This very rare parrot is almost extinct, and the specimen, which arrived on February 19, 1912, is apparently the first that has been imported alive into the United States. The shama thrush continues in popularity as a substitute for the mocking bird, as shown by the fact that more than 200 were brought in during the year. Rare birds imported for the first time included several East Indian species, most of which were consigned to the New York Zoological Park. Among the rarer mammals was a female gorilla, received by the park on September 23, 1911, which only lived until October 5. By far the larger number of mammals were guinea pigs and monkeys, imported for laboratory and pathological experiments. About half the squirrels imported are the European red squirrel, and the remainder are chiefly Mexican species. There were also about 1,300 white mice, intended chiefly for research purposes, a few silver and cross foxes, several beavers, and a number of ferrets. The foxes and beavers come from Canada, the former imported for breeding purposes, the latter for exhibition, while the ferrets are imported chiefly for killing rats.

No prohibited species, so far as known, have gained entry during the year. Under date of July 10, 1911, the director of the New York Zoological Park ordered the destruction of the female mongooses belonging to the park, leaving three males. One of the latter died in March, and on June 2, 1912, the other two were still on exhibition.

NATIONAL GAME AND BIRD RESERVATIONS.

It is not too strong an assertion to say that the antelope is in greater danger of extermination than any other kind of American big game, and that serious consideration and well-directed effort are necessary to prevent the species from becoming extinct in several States in which it was formerly abundant. The Yellowstone Park does not contain half as many antelope as it did four years ago, and not a national game refuge has been established in a region where antelope still remain, while attempts to stock certain bison ranges with those animals have not as yet met with success. There is great need for a suitable preserve, especially for antelope, in the antelope country. More effective protection seems to have been provided on private ranges in the Southwest than under either Federal or State auspices.

The work of caring for elk in Jackson Hole was continued during the winter in cooperation with the State authorities, and efforts will be made to place the winter feeding of elk at that point upon a more permanent basis by the acquisition of a refuge where hay can be produced and fed. It is estimated that 7,250 elk were fed last winter, but this is less than half of the 17,160 estimated to have wintered in that region. Adding these to the more than 30,000 which wintered in the northern part of Yellowstone Park, it shows that the great herds in the park and its vicinity number less than 50,000.

With the 10 calves born this spring, the buffalo on the National Bison Range have now increased to 81, or 44 more than the original number placed there three years ago. The beaver having disappeared from Mission Creek, arrangements have been made to procure fresh stock from the Yellowstone Park, and there are now several elk and some antelope on the range.

The national bird reservations number 56, including the Pribilof Reservation in charge of the Department of Commerce and Labor and the four new ones created during the year at Forrester Island and Hazy Islands, Alaska, Niobrara, Nebr., and Green Bay, Wis. For the better organization of the administration of these, four inspectors were appointed—one for the reservations in Oregon, one for the coast reservations in Washington, one for the mountain district, and one for the Florida reservations in the Gulf district. An additional warden was appointed for Clear Lake Reservation, Cal., and a special agent detailed to inspect the reservation at Bellefourche, S. Dak., Carlsbad, N. Mex., the southern reservations of Florida, and Forrester Island, Alaska. No species has ever been introduced on any of the bird reservations, with the exception of the European rabbit on Farallon Islands, Cal., and Laysan Island, Hawaii. In both cases they have increased so enormously that they have already become a serious pest, and efforts will be made to reduce them on Laysan Island. As in former years, permits have been issued to trap on two of the Oregon reservations, and 4,858 muskrats, 190 minks, 13 skunks, 11 weasels, 12 raccoons, 3 otters, and 21 coyotes were taken. The severe storms destroyed many nests, eggs, and young birds on the Passage, Key, and Pelican Island Reservations, but information received in the spring indicated that they had recovered from their losses.

Every effort has been made to stop the sale of plumage of certain birds, particularly herons, which in recent years have been slaughtered for the millinery trade. Laysan Island has recovered somewhat from the devastation wrought by plume hunters in 1910, but the colonies are still in a sadly reduced condition. Through the cooperation of the Revenue-Cutter Service, the *Thetis* visited the island twice during the year and reported everything in good condition.

Semiannual visits by cutters of this service will prevent molestation of the birds, as poaching will thus be made unprofitable.

GAME PROTECTION IN ALASKA.

At the close of the fiscal year new regulations were issued under the Alaska game law to afford additional protection to deer, prevent the excessive traffic in moose on the Kenai Peninsula, and to suspend deer hunting on five islands in southeastern Alaska, thus practically making them game refuges. The suspension of the sale of vension in 1911 has been continued through the season of 1912. Through cooperation of the Secretary of the Treasury, special instructions were given to the revenue cutters patroling Bering Sea to insure a strict enforcement of the law protecting walrus.

Under the appropriation of $15,000 for the protection of game, wardens appointed by the governor were stationed at several of the more important points. Sixteen permits were issued for the collection of specimens for scientific purposes or for exhibition.

INFORMATION CONCERNING GAME.

Through cooperation with the Forest Service, comprehensive data were collected for the first time regarding the number of big game animals killed on the various national forests, and as these forests include the principal hunting districts in the Western States the data thus collected furnish a practically complete basis for estimating the total number of big game killed in several of the Western States.

The index of game legislation has been almost completed. During the year the laws of Maine, Massachusetts, New Hampshire, Rhode Island, Connecticut, Pennsylvania, and most of those of New York were indexed. At the present time the only gaps in the index are a few years in New York, Maryland, and North Carolina. The work had advanced to a point early in the year which warranted the publication of a summary of some of the more important provisions under the title "Chronology and Index of American Game Protection from 1776 to 1911."

Data on the protection of migratory birds have been summarized, and likewise information brought down to date on the subjects of hunting licenses, National and State game preserves, bag limits, game commissions, and similar topics concerning which frequent requests for information are received. As in several previous years, data concerning the number and details of fatal hunting accidents were collected. These data show a regular increase in the number of fatalities in the United States from year to year, but it is believed that a certain proportion of these accidents can be obviated by special legislation.

The usual annual game publications were issued, including the "Directory of Game Officials," "Summary of the Game Laws for 1911," and posters showing the open seasons for game.

DIVISION OF ACCOUNTS AND DISBURSEMENTS.

During the year there were received, audited, and paid 129,584 accounts, amounting to $16,032,446.08. More than 5,000 of these accounts, moreover, were so-called combined accounts, in connection with which there was probably a saving of at least 25,000 checks, to say nothing of the saving of other clerical labor. There were also audited and sent to the Treasury for payment 6,241 accounts. In the payment of the 129,584 accounts mentioned above it was necessary to draw 212 requisitions on the Treasury and issue 241,544 checks. There were issued during the year 30,940 purchase orders for supplies, 6,683 letters of authorization for travel, 47,225 requests for passenger travel, and 11,105 requests for department bills of lading and requests on the Quartermaster General for the transportation of Government property, while about 187,600 letters were written or received in the ordinary transaction of business.

To carry on the work of the Department of Agriculture during the fiscal year ended June 30, 1912, Congress appropriated $16,900,016 for the ordinary expenses of the department, in addition to which permanent annual appropriations and special appropriations amounting to $6,190,826.15 were available, making a total of $23,090,842.15.

The disbursements of the department to June 30, 1912, pertaining to the fiscal year 1912 amounted to $17,772,993.80, and the greater part of the balance of $5,317,848.35 will be required for the settlement of outstanding liabilities.

The amount for rent of buildings in the District of Columbia for the several branches of the department was $71,804.75, and all accounts for the fiscal year 1910 having been settled, the unexpended balance of appropriations for that year, amounting to $344,760.56, was covered into the Treasury on June 30, 1912. The account for the fiscal year 1911 is still open.

The amount estimated for the fiscal year 1914 in the annual estimates for the regular appropriation bill is $18,287,230, which includes $1,440,000 for agricultural experiment stations, an increase of $1,635,734 over the appropriation bill for the fiscal year 1913. In addition to this, there will be available permanent annual appropriations amounting to $5,689,200, making a total of $23,976,430.

There is also an estimate in the sundry civil bill for printing and binding for this department amounting to $512,500, making a grant total of $24,488,930. The increase requested in the regular appropriation bill will be used principally in the extension of the

activities of the department in connection with the eradication of tuberculosis among domestic animals, the eradication of cattle ticks, research work now under way on various dairy problems, the prevention of the introduction into the United States and the manufacture and sale therein of dangerous or worthless serums and viruses for use in the treatment of domestic animals, grain standardization and general cereal investigations, farm-management investigations, farmers' cooperative demonstrations, the classification of agricultural lands, investigations in agricultural chemistry, the enforcement of the food and drugs act, meat inspection, the determination of sources of supply of nitrates and other fertilizer materials in the United States, soil survey, entomological and biological studies and investigations, farmers' institutes, irrigation investigations, investigations of systems of road management and best methods of road making and maintenance, field experiments with road-making materials, and the enforcement of the insecticide act and the plant quarantine act.

DIVISION OF PUBLICATIONS.

The results of the experiments, investigations, and activities of the department are made available for the information and guidance of the people by means of its publications.

By the most careful economy it was possible to issue 24,900,557 copies of 1,462 new pamphlets, containing 32,842 printed pages and 3,518 illustrations, and 9,778,000 copies of 648 reprinted documents, containing 23,179 pages and 3,977 illustrations. Therefore the total publications handled in this office amounted to 2,110 separate pamphlets, containing 56,021 pages and 7,499 illustrations, and aggregating 34,678,557 copies. Of these 20,998,557 were miscellaneous publications, 10,409,000 were Farmers' Bulletins, and 3,271,000 were lists of available Farmers' Bulletins. That so many new publications were issued and so great a number distributed is due to the economical and efficient supervision of the printing fund by the Division of Publications.

NO PUBLICATIONS WASTED.

The fact of greatest interest in connection with this large volume of publications is that they were all distributed to people who asked for them, and that many more could have been sent out if we had been able to fully supply the demand, which came from every section of the country. No one who applied has failed to receive at least some of the publications he wanted if they were available. It has been the policy to supply some publications to every applicant rather than a large number to a few persons, and with the exercise of discretion in the distribution of the publications none have been wasted.

On account of the great activity of the department's investigators and the unprecedented demand for published results, the appropriation for printing and binding was practically exhausted early in June, in consequence of which numerous publications containing accounts of the results of important investigations were delayed until July 1, to the great inconvenience of the department and the disappointment and loss of the public. An increase in the appropriation is necessary in order to enable the department to publish all the information acquired for the benefit of the people, as required by the organic act creating the department.

FARMERS' BULLETINS.

The demand for Farmers' Bulletins has never been so great. This is not surprising, since they are written in plain language and cover such a variety of subjects, among which are some sure to be of interest to everyone. Forty-four new bulletins of this series were issued during the year. It is now 23 years since the first Farmers' Bulletin was issued, and the unfailing popularity of these pamphlets has demonstrated the wisdom of their publication. In 1896 less than 2,000,000 met the demand, while in 1912 nearly 11,000,000 copies were issued, and many more were requested by correspondents, but could not be supplied. These bulletins are distributed jointly by the department and Members of the two Houses of Congress, four-fifths being placed at the disposal of Senators, Representatives, and Delegates. With the present appropriation it is possible to make an allotment of 12,500 copies to each, which is admittedly insufficient to supply the requests. With the increased membership of the Sixty-third Congress an increase of 10 per cent in the present appropriation of $125,000 will be required to allot this number to each Senator, Representative, and Delegate, and I have accordingly submitted an estimate for $137,500 for the printing of these publications. Of these publications 7,351,262 copies were distributed upon the orders of Senators and Representatives, being 1,877,183 more than during the last year.

SALE OF DEPARTMENT PUBLICATIONS.

The superintendent of documents of the Government Printing Office is authorized by law to sell Government publications, and, with the consent of the head of the department, to reprint such as may be needed to meet the demands when his supply is exhausted, defraying the cost out of his receipts for publications sold.

Last year he sold 171,866 copies of this department's publications, 120,450 of which were provided from reprints. The amount of these sales was $16,428.07. The larger number of the publications sold

were from the technical and scientific series, and of course much the greater part of the receipts was from the sale of that class, but there was an increase in the number of popular pamphlets called for, showing the willingness of the unscientific reader of agricultural literature to pay the nominal price charged when the department's supply is exhausted.

LARGER EDITIONS OF 100-PAGE PUBLICATIONS.

In my last report reference was made to a provision of a bill revising the general printing law pending in Congress increasing the limit on editions of bulletins of the department from 1,000 to 2,500 copies. The bill is still pending, and it is earnestly hoped that this provision will be retained, in order that the department may distribute its more important publications, in many cases of high scientific value, more widely among the colleges, universities, and investigators in the scientific world, instead of being limited to Government institutions, and most of these only in this country. There are numerous other equally important provisions in the new printing bill which if enacted will enable this department to administer its appropriation more economically and efficiently and increase its usefulness to the people.

EDUCATIONAL USE OF OUR PUBLICATIONS.

The demand from the instructors and pupils in all grades of schools for agricultural literature is evidenced by the numerous requests, frequently for large numbers, received for department documents, which, owing to limited funds, it has not been possible to grant. Many of our publications are being used as textbooks, and it is believed that such use should be encouraged, even at the expense of an increase in the fund for printing.

SCIENTIFIC AND TECHNICAL PUBLICATIONS.

The publications of a scientific or technical character constitute about 35 per cent of those issued by the department, and while their distribution is naturally rather restricted, they constitute the permanent record of the achievements of our scientists, and many of them furnish the basis for the numerous popular bulletins and reports. They are of the greatest importance, and their prompt publication should always be insured. This has not always been possible with the available funds, and an increase in the appropriation has been requested and should receive favorable consideration. The issuance of a monthly or quarterly serial to which all bureaus, divisions, and offices could contribute would afford a convenient and permanent

record for publishing many brief scientific papers which separately are too small to print, but which contain valuable results which should be published rather than preserved only in manuscripts, as at present.

ILLUSTRATIVE WORK.

Aside from the illustrations for publications, much of the work comprised diagrams, photographs, slides, etc., for the use of department experts in connection with lectures which they are called upon to deliver before agricultural organizations and societies in many parts of the country, showing the work of the department. This is one way of taking the department to the farmer.

The increasing use by the press of extracts from our publications is most gratifying, supplementing the wide distribution already given them by the department.

In every branch of the department's publication work, comprising editing, indexing, illustrating, and finally, the distribution of the publications, the results achieved exceeded those of any other year.

BUREAU OF STATISTICS.

The primary duty of the Bureau of Statistics is the preparation of monthly reports giving seasonable information concerning the acreage planted to the principal crops of the United States, their condition from month to month during the growing season, and their yield per acre, total yield, and quality; also the condition from month to month and relative production, expressed in percentages of full production of minor crops.

The number, value of farm animals, stocks of grains in the hands of farmers at specific dates, and the average prices received by farmers for leading products each month are reported; and a few other miscellaneous subjects, such as causes of crop damage, movement of crops, cost of transportation, farm wages, and the progress of spring plowing and planting, are dealt with.

SOURCES OF INFORMATION.

These reports are based on statements made by voluntary correspondents and salaried employees located throughout the agricultural sections of the country, in reply to inquiries prepared in the bureau and sent out from Washington embracing the subjects dealt with each month.

The voluntary correspondents are public-spirited citizens rendering service without compensation, and are excellent farmers, as careless or indifferent farmers will not take the pains to report month after month and year after year without money compensation; and some

of these men have served the department 36 years. These voluntary correspondents, numbering about 130,000, consist of township correspondents, reporting for the townships in which they reside; county correspondents, reporting for the county in which they reside, from personal knowledge and upon two or more reports made by assistants living in other parts of the county; and special correspondents, supplying special information, such as crop yields, farm prices, cotton acreage and ginning, concerning grain in mills and elevators, the live stock on farms, and the tobacco industry.

The salaried reporters are State statistical agents, one residing in each State and rendering monthly reports to the bureau based on reports received by him from correspondents throughout the State and on his own personal knowledge and observation, and the special field agents assigned to duty in groups of States, performing travel throughout their territories, examining crops, interviewing farmers, country merchants, implement dealers, and others from whom dependable information can be obtained, and reporting each month to the bureau the conditions as ascertained by them.

COMPILING THE REPORTS.

The work of finally making the bureau's crop estimates each month culminates at sessions of a board whose personnel, with the exception of the chief of the bureau, who presides, and two regular members, is changed each month. The meetings are held behind locked doors, and all telephone or other communication is effectively prevented until the report is handed to the Secretary.

No other Government attempts to make so elaborate reports nor has so widespread or numerous crop correspondents. But the reports issued from month to month do not purport to be other than estimates; they are not the results of actual enumerations, as are the figures reported decennially by the Bureau of the Census. Every quantitative estimate of this bureau, whether relating to acreage and production of crops or numbers of live stock, is nothing more than a consensus of judgment of many thousands of correspondents and a limited number of agents.

The annual estimates regarding acreage of crops and numbers of live stock are based on corresponding estimates for each preceding year, there being no other bases to which can be applied the percentages of increase or decrease indicated by reports received from correspondents and agents, except once in 10 years, when census figures become available.

It is, of course, out of the question that an agricultural census be taken every year; the expense would be prohibitive. The only way in which the constant and increasing demand for information can be met is through carefully made estimates. It is not claimed that the

estimates of the Bureau of Statistics are strictly accurate; no estimate can be. They are given as the best available data, representing the fullest information obtainable at the time they are made.

If the requirement that an agricultural census be taken hereafter every five years is carried into effect, the estimates of this bureau can be checked up and adjusted to the facts as disclosed by the quinquennial enumerations and new bases for estimates be provided every five years.

THE CROP REPORTER.

The Crop Reporter, of which 175,000 copies are printed each month, is sent to all who request it. It is circulated principally among farmers, including the bureau's voluntary correspondents, throughout the United States.

Among the subjects of interest considered in the Crop Reporter during the past fiscal year may be mentioned the following: "Interpretation of the crop-condition figures"; "Wheat movement from farms, monthly, 1910–11"; "Per capita imports and exports of agricultural products, by decades, since 1866"; "Monthly movement of grain"; "Sugar-beet production in United States, 1910"; "Durum wheat exports, 1910–11"; "Cost of producing barley"; "Bushels of weight and bushels of volume"; "Wheat prices in England, six centuries, chart"; "Cost of producing potatoes in United States, by grand divisions"; "Hop movement in United States, 1902–1911"; "Causes of crop damage, 1909–10"; "Stocks of potatoes, January 1, 1912"; "Seedtime and harvest"; "Quantity of wheat and oats sown per acre, by States"; "Wheat supply and distribution, by States"; "Wheat consumption per capita, by countries"; "Egg receipts at seven markets annually since 1891"; "Live-stock receipts at seven markets annually since 1900"; "Farm wages, 1911"; "Stock of wheat in interior mills and elevators"; "Length of service of crop correspondents"; "High prices and crop production"; "Apple shipments on important railroads"; "Index numbers of production per capita and prices of important farm products, 1866–1911"; "Testing of germinating quality of corn"; "Causes and extent of cotton damage"; "Railroads and agriculture."

DIVISION OF PRODUCTION AND DISTRIBUTION.

This division conducted an investigation during the last fiscal year concerning the economic results of cold storage and the relationship of cold storage to prices. The aggregate information obtained in this investigation constitutes, in variety and mass, much the largest body of facts concerning this business in its economic aspect that has been collected.

The latest comprehensive investigation of the wage rates of farm labor was completed during the past year, so that the department now has a record of averages of such wage rates for each State, for geographic divisions of States, and for the United States extending back to 1866. A simultaneous investigation was conducted with regard to the supply of such labor, and this constitutes the first comprehensive treatise that has been published on this subject.

The efforts of railroad companies to promote agriculture, especially by soliciting settlers to farm lands, by aiding in agricultural education, and by making other special efforts not strictly to be classed as transportation, were treated in a bulletin which went to press about the close of the fiscal year. The aim of this undertaking is to make practically a complete survey of the activities of the railroad companies in the promotion of agriculture.

In a bulletin published during the year are embraced the dates of planting and harvesting corn, winter wheat, spring wheat, fall-sown oats, spring-sown oats, barley, rye, buckwheat, flax, cotton, and tobacco. The collection and tabulation of materials for another bulletin relating to the forage crops was nearly completed. At the same time a third line of work, the dates of planting and harvesting vegetable crops, has been in hand.

A system was established for the collection of annual statistics of cane sugar and sugar-cane production in the United States and its insular possessions. Statistics of the campaign of 1911–12 for most of Louisiana and Texas and of the campaign of 1910–11 for Hawaii and Porto Rico had been obtained by the close of the fiscal year 1912.

An article was prepared for the Yearbook for 1911 on the reduction of waste in marketing fresh fruits and vegetables, as effected by improved methods of distribution and by better transportation facilities. The regular annual publications prepared in this division included the bulletin on exports of farm and forest products from the United States; the corresponding imports bulletin; a statement giving the shipments of apples on railroads of the United States for the crop of 1911, and another statement showing the exports of durum wheat. Monthly receipts of eggs and poultry at large cities were shown regularly in the Crop Reporter. The production and domestic supply of cotton, tobacco, rice, and hops in the United States, from the earliest available date to the latest, were shown in four circulars. These statistics were formerly included in the Yearbook.

DIVISION OF RESEARCH AND REFERENCE.

Ten circulars, each entitled "Foreign crops," have been prepared in the division at regular intervals during the year. In addition thereto, 2 bulletins, 7 circulars, 2 Yearbook separates, 12 monthly editions of

the Crop Reporter, and 3 miscellaneous publications, all prepared in other branches of the bureau, have been read and revised in this division.

Four bulletins, entitled, respectively, "The world production, trade, and consumption of coffee," "Some statistical results of farm bookkeeping in Switzerland," "Land and labor," and "Comparative prices of staple products in leading markets of the United States," are now being prepared in the division and will probably be ready for publication during the next fiscal year.

THE PURCHASING POWER OF FARM PRODUCTS.

In 1910 an investigation was made in the Bureau of Statistics which showed that the money value of 1 acre of the farmer's crops in 1909 was 72.7 per cent more than the money value of 1 acre of his crops in 1899; that the average money value of the articles which a farmer buys was about 12.1 per cent higher in 1909 than in 1899; and consequently, as a result of the greater increase in price of what a farmer sells than in price of what he buys, the net increase in the purchasing power of the produce of 1 acre was 54 per cent; that is, the product of one acre in 1909 would exchange for 54 per cent larger quantity of the things farmers buy than the product of 1 acre in 1899. So much public interest has been evinced in this line of inquiry, bearing so closely upon the subject of the "cost of living," that it has been continued during the past two years.

Although the aggregate production of crops in 1911 was about 6.3 per cent smaller than in 1910 and 0.5 per cent smaller than in 1909, the total money value of crop production in 1911, by reason of enhancement in prices, was about 2.1 per cent greater than in 1910 and 3 per cent greater than in 1909. According to a report of the Bureau of the Census the value of all crops in the United States in 1909 was about $5,487,000,000; on this basis it is estimated that the money value of all crops in 1910 was about $5,537,000,000, and of crops in 1911, $5,654,000,000.

The money value of 1 acre of produce in 1911 averaged about $15.48, as compared with $15.50 in 1910, $15.99 in 1909, and $9.48 in 1899. The larger aggregate value of crops in 1911 than in 1910 and 1909 was due to increased acreage.

An investigation of prices of about 85 articles generally purchased by farmers indicates that such articles averaged in price in 1911 about 1.1 per cent higher than in 1910, 2.6 per cent higher than in 1909, and about 15.3 per cent higher than in 1899.

Taking into consideration the variation in the price of things which farmers buy and in the things which farmers sell, it appears that the purchasing power of 1 acre of crops in 1911 was 1.2 per cent less than in 1910, 5.7 per cent less than in 1909, and 41.6 per cent greater than in 1899.

Upon the basis of the purchasing power of the value of 1 acre of produce, the year 1909 stands as the most prosperous of recent years and apparently the most prosperous for farmers in the past 50 years for which there are records.

LIBRARY.

The growth of the library during the past year has exceeded that of any previous year. The total recorded number of books, pamphlets, and maps in the library on July 1, 1912, was 122,043. The total number of books and current numbers of periodicals borrowed from the main library and the libraries located in the bureaus and divisions exceeded 180,000. The number of books lent to libraries and scientists outside of the city of Washington was 620. The books borrowed from other libraries for the use of this department numbered 6,405, the majority of which were from the Library of Congress and the library of the Surgeon General's Office.

The total accessions for the year were 9,122, of which number 5,243 were received by gift and exchange. The large number of accessions by gift is especially gratifying, but it is a matter of regret that the funds available for the purchase of books and subscriptions did not permit of larger accessions by purchase.

As the national agricultural library, connected with the national institution for agricultural research, it has been the aim of this library to extend its services as far as possible to the investigators in agricultural science throughout the country. The land-grant colleges and experiment stations, though State institutions, are supplied in part by funds given by the National Government to the States to be used for their maintenance, and they have certain definite relations with the different branches of the National Government. Their relations with the Department of Agriculture are closer than with any other department of the Federal Government, and it is felt that they have, therefore, a just claim to a share in the services of the library of the department. This service the library has endeavored to render to the agricultural colleges and experiment stations through the printing of cards for department publications and for the accessions to the library, through the loan of its books, and by the distribution to them of its duplicates. It has also attempted in a limited way to supply bibliographical information in regard to the literature of agriculture.

OFFICE OF EXPERIMENT STATIONS.

RELATIONS WITH AGRICULTURAL EXPERIMENT STATIONS.

The progress of the experiment stations during the past year continued along the same general lines in which advancement was noted the year before. A general increase in equipment, growth in the

various station activities, and organization on a more thorough and systematic basis was recorded, and in many instances the stations were benefited by greater financial assistance on the part of State legislatures and in a lesser degree from other sources.

The appropriations received by the stations as provided for by the acts of Congress amounted to $1,545,000 for the fiscal year ended June 30, 1912. Since the Adams fund has reached its maximum the Federal funds as determined by the Hatch and Adams Acts remain the same from year to year for all stations except those located in Alaska and the insular possessions, exclusive of the Philippines, for which Congress up to the present has made provision in the annual appropriations for this department. The work of the stations during the past year was aided by State appropriations to the extent of about $1,250,000, and the Federal and State funds were supplemented by fees, contributions, and amounts realized from the sale of farm products and other sources aggregating nearly a million dollars. The total of the funds at the disposal of the experiment stations for the year was approximately $3,767,000.

The policy previously pursued by this office in relation to the expenditure of the Hatch and Adams funds was maintained. The inspection of the past year's accounts showed in general a prompt satisfaction of station liabilities and an improvement in the system of accounting. The office has held that the expense of station accounting should be limited to only such a charge against the Hatch fund as is involved in the simple bookkeeping required by this department to show the expenditure of the Federal funds for each fiscal year. Efforts were continued to secure a larger amount of definite experimental work with the Hatch fund by relieving it from charges for administration, compiled publications, and demonstrations.

In accordance with the principle of using the Federal funds only for experimental and research work, the office has continued to emphasize and urge the need of systematizing the extension work and organizing it under a supervision other than that of the stations. The progress made in this direction is illustrated by the fact that already in more than 40 States extension work has been organized under the agricultural college, and extension directors, as special and separate officers, have been appointed and placed in charge of the work.

With regard to station publications, the department took the position that the issue of compiled bulletins of an entirely popular character, as already mentioned, can not be recognized as a proper charge against the Hatch fund, and that all stations should adopt a definite and regular policy in publishing the annual report as stipulated in the Hatch Act. Attention was also called to the importance and advisability of bringing out more conspicuously in the station publica-

tions, by a system of classification or otherwise, the results of research work on agricultural problems, and the belief was expressed that if the issuance of popular compiled bulletins, quite necessary in extension work, be left entirely to the extension departments, much ground would be gained in making the stations' contributions to agricultural science more accessible to the scientific world as well as to the general public.

Numerous lines of important work were pursued by the stations during the year. A brief mention of some of the results recently obtained will give a general idea of the scope and progress of this work.

The Colorado Station demonstrated the occurrence of apparently rapidly extending areas of soil in irrigated orchards and sugar-beet fields containing nitrates in such excessive amounts as to destroy the crops. This excess of nitrates is thought to be due to phenomenal bacterial activity.

The Missouri Station determined that nitrogen and phosphorus are the limiting elements of plant food in Missouri soils and that the majority of Missouri uplands respond to an application of these elements.

Analyses of drainage waters at the New York Cornell Station showed a loss of calcium of over 200 pounds per acre more on fallow than on soil growing corn and oats.

The North Dakota Station found that old land may be made as suitable for growing flaxseed as new land. From experiments and observations the conclusion was drawn that soil deterioration from a chemical standpoint in the principal flax and wheat regions is insufficient to account for the deteriorated yields in quantity and quality, and the deterioration along these lines is attributed to unsanitary soil conditions. The station has worked out specific rotations and methods of culture and seed treatment tending to reduce the activity of these soil troubles.

In studying the relation of soil bacteria to evaporation the Wisconsin Station found that bacterial activity in the soil may so change the nature of substances in solution in the soil water as to exert an influence upon evaporation.

Results secured at the Idaho Station showed a marked increase in protein content of several varieties of wheat grown on land cropped the previous year with potatoes, as compared with land in wheat the year before. Irrigation investigations at this station showed that wheat receiving from 18 to 20 inches of water during the season gave a yield of over 50 per cent above wheat receiving no water and above wheat receiving 50 inches during the same period of time.

The work in agronomy at the Kansas Station brought out quite clearly that the time and the method of seed-bed preparation for

wheat very materially influenced the yield, especially in a dry season. Land disked but not plowed produced 4¼ bushels of wheat per acre, while land plowed at the right time, July 15, and at the right depth, 7 inches, gave a yield of 38⅓ bushels.

New varieties of timothy, originated at the New York Cornell Station, have shown strikingly superior qualities in drought resistance. The average yield for 17 new varieties in a dry season was 7,153 pounds per acre as compared with 4,091 pounds for seven check plats of ordinary timothy. Corn-breeding work with two different varieties resulted in each instance in a gain of about two weeks in earliness or time of maturing. Oat hybrids and selections made by the station and tested for five seasons have also shown marked improvement in yielding capacity as compared with common sorts.

The results of a study of the mineral nutrients in bluegrass by the Ohio Station indicated that some bluegrass pastures in the State contain percentages of the mineral nutrients twice as high as others and that these differences are due to differences in the soils upon which the grasses are grown. It was also found that the content of bluegrass in mineral nutrients may be very greatly increased by the use of fertilizers.

Work of the Utah Station has shown that Turkey Red wheat is the best yielding winter wheat of the State, and that the flour produced from it is of the best and equal in quality to any produced in other parts of the country. The work in dry farming conducted by the station on sagebrush land has shown the practicability of farming these lands under dry-farming methods, and as a consequence the greater portion of the sagebrush areas of the State have been taken up.

In its work on weed eradication, the Wisconsin Station found that a crop of hemp after cultivated summer fallow was very effective in killing out quackgrass and Canada thistle.

The plant-breeding and purebred-seed campaign initiated in most instances by the experiment stations is beginning to show notable results from more or less independent efforts. The Wisconsin Experiment Association, for instance, with a membership of about 2,000, is reported as selling annually $500,000 worth of purebred seed.

Working along the lines of animal nutrition, the Illinois Station discovered that within reasonable limits gain in weight in growing animals is not in proportion to the feed consumed, while the Missouri Station demonstrated that the practice of maintaining young heifers on a high plane of nutrition does not affect their milking quality, and that the size of the cow may be permanently increased by liberal feeding when young.

The Wisconsin Station observed that silage, as compared with soiling crops, can be fed with greater advantage to dairy cows during

the summer season. The South Dakota Station, in testing the value of corn silage and roots for feeding steers, found that when these substances were fed with shelled corn and wild hay there was a larger gain than without these feeds, and that for fattening steers hay with silage proved to be better than hay or silage alone as a roughage.

In horticultural work, the results of orchard experiments by the Missouri Station showed that proper pruning alone on a given plat of peach trees resulted in a yield giving net returns of $125 per acre. Proper fertilizing with ammonium sulphate on another plat in the same orchard resulted in a yield of $40 per acre net, while on a plat where proper pruning, fertilizing, and spraying were all combined the peaches yielded a net profit at the rate of $300 per acre after paying the expenses of management and shipping the crop to market. A successful method of budding the walnut was worked out by the Oregon Station. This method is based on the principle of securing dormant 1-year-old buds, while propagators heretofore have attempted to use buds of the current year's growth.

The Delaware Station, in cooperation with this department, worked out a method for quickly immunizing against anthrax in case of an outbreak, and produced a serum with which it is possible to protect a sheep against an otherwise mortal dose of bacilli and to produce an immediate passive immunity.

In experiments to determine the efficiency of mitigated cultures of human tubercle bacilli as a vaccine against bovine tuberculosis, the Missouri Station found that vaccinated cattle contracted the disease when exposed to infected animals, even under the favorable conditions of an outdoor life. The fecal excretions of tuberculous cattle were a much more important source of infection to swine than foods contaminated with the saliva of tuberculous cattle. Not only a very large percentage of the pigs fed behind tuberculous cattle became infected with the disease, but some of the pigs showed well-developed tubercular lesions in less than four weeks of exposure. This station continued the manufacture of hog-cholera serum and distributed 60,000 doses during the year. In hog-cholera serum work the South Dakota Station showed that 90 per cent of all animals treated safely withstood disease.

The Ohio Station demonstrated the practicability of eradicating bovine tuberculosis and of building up a herd of sound animals from the progeny of tuberculous cattle by the systematic use of the tuberculin test and the thorough disinfection of barns.

In its studies of citrus diseases the Florida Station ascertained that the fungus causing stem-end rot is present in the orchard during practically the entire year, being found on partially decayed branches and twigs when the fruit is immature or after it is harvested.

The New York State Station worked out a method for the preparation of lime-sulphur wash enabling fruit growers to make their own preparations at a very considerable saving. Ten years of potato spraying with Bordeaux mixture at this station resulted in an average increase of 69 bushels per acre from three sprayings during the season, and an increase of 97½ bushels per acre from spraying every two weeks, or from five to seven times during the season. In a duplicate series of experiments on Long Island the average increase for the 10 seasons was 25 bushels per acre from three sprayings and 45¾ bushels from spraying every two weeks. In a similar way the results of 20 years' work with Bordeaux mixture on late potatoes at the Vermont Station showed an average yield per acre of 268 bushels for the sprayed and of 163 bushels for the unsprayed crops, representing a gain of 105 bushels per acre, or an increase of 64 per cent in favor of spraying.

In a study with a view to adapting the carbonation process of clarifying cane juices, the Louisiana Station discovered features in regard to temperature and alkalinity which enabled it to remove experimentally a much greater per cent of impurities than has heretofore been possible in sugar-house practice. This station also demonstrated that the fuel efficiency of bagasse can be materially increased by utilizing the flue gases in drying this product, and showed, further, how moisture contained in bagasse and other conditions influences its fuel value.

The results of breeding work with poultry at the Maine Station indicate that the female fowl does not transmit the heredity factors to her daughters, but that she may transmit the hereditary factor which makes for high egg production to her sons, and they can then stamp this quality on their female progeny.

We have reached the quarter centennial of the establishment of our national system of agricultural research institutions. Through this entire period the stations have been settling down toward their proper and ultimate research level. The gradual increase of the Adams fund to its maximum of $15,000 per year has led up to a degree of efficiency in research work which otherwise could not have been reached within the same length of time and with an equal financial outlay. However, before the coming of the Adams fund the stations solved many important practical problems and scientific questions. To enumerate these would be impractical, but as they are rounding out the first quarter century of station activity it might be well to mention at this time one of the first noteworthy achievements of their endeavor to combine science with practice in the development of our agricultural industry. Over 21 years ago the Babcock test was perfected at the Wisconsin Station, and at present is in use in its original form. The scientific principles on which it is

based have not been supplanted, although the mechanical devices employed have been improved. This test made it possible to buy and sell milk on an equitable basis, and thus revolutionized the dairy business in the creamery as well as on the farm. If this practical and scientific method had been established by other than experiment-station effort it would have required large sums of money for royalties to satisfy the patent rights; but Dr. Babcock, with the noble conception of the disinterested scientific worker, gave it to the Nation and the world. With achievements of this kind to their credit the experiment stations can look back over their early history with pride and gain renewed zeal and encouragement for the future.

THE AGRICULTURAL COLLEGES AND SCHOOLS.

The faith of the people of the United States in agricultural education is becoming each year more apparent in the better support given to the agricultural colleges, in the establishment of additional agricultural courses in universities and colleges of private foundation, in the increasing number of States giving financial aid to secondary instruction in agriculture, in the attention given to the training of teachers of agriculture for secondary and elementary schools, in the large attendance of students at all sorts of colleges and schools in which agriculture is well taught, and in the great popularity of certain forms of elementary instruction in agriculture, such as children's gardens in cities, boys' corn clubs, girls' garden and canning clubs, and other juvenile agricultural club work.

According to a list published April 30, 1912, by the Office of Experiment Stations and compared with a similar list published in May, 1910, the number of land-grant colleges giving instruction in agriculture has increased from 57 to 61 and the number of privately endowed colleges from 24 to 42. Columbia University has established short courses and extension work in agriculture, and Syracuse University has added colleges of agriculture and forestry. Practically all of the State colleges for women in the South now maintain courses in agriculture, giving attention particularly to gardening, floriculture, and poultry husbandry.

Among secondary schools there are now 78 special agricultural schools, as compared with 58 in 1910, and 289 public high schools receiving State aid for courses in agriculture, whereas in 1910 there were 28. Minnesota alone is giving $125,000 a year to stimulate the introduction of agriculture, home economics, and farm mechanics into public high schools, 30 of these schools receiving $2,500 a year each and 50 schools receiving $1,000 each. Kansas, Louisiana, Maine, Maryland, Massachusetts, New York, North Carolina, Virginia, Texas, and Wisconsin are the other States that appropriate funds for this purpose.

Of public high schools teaching agriculture without State aid the number has increased from 432 in 1910 to over 1,600 in 1912, and of State and county normal schools which are giving their students some instruction in agriculture the number has increased from 156 to 196.

These are all institutions for white students. In addition, there are over 100 secondary schools for negroes, 16 special elementary schools for negroes, and 112 schools for Indians, all of which are giving some instruction in agriculture.

The total number of institutions listed in 1910 as having students in agriculture was 863, while at the present time there are 2,575, an increase of 1,712 institutions, or nearly 200 per cent, in two years.

FARMERS' INSTITUTES.

The work of the department in aid of farmers' institutes has continued under the direction of the Office of Experiment Stations. Reports received from the several States show that 5,663 regular institutes were held in 40 States. The total number of sessions was 15,965 with a total attendance of 2,272,146. It is estimated that complete reports from all States would show over 19,000 sessions of regular institutes with a total attendance of over 2,500,000. The reports in hand show that the special institutes aggregated an attendance of 1,389,266, making the entire attendance at institute meetings of all kinds nearly 4,000,000, an increase of over 360,000 over the figures for last year.

THE DEPARTMENT'S INSULAR AGRICULTURAL EXPERIMENT STATIONS.

The work of the experiment stations maintained by this department in Alaska, Hawaii, Porto Rico, and Guam during the fiscal year 1912 was very successful, and the results of their efforts in attempting the diversification of agriculture are beginning to be apparent. The practicability of farming on a considerable scale, gardening, small-fruit growing, and stock raising in Alaska has been fully demonstrated. In Hawaii and Porto Rico new industries are being developed and old ones revived, so that a much wider field of agricultural and horticultural activity is reported. In Guam the introduction of new crops has been eminently successful, and the restoration of agriculture to its former importance is believed to be assured. During the year some improved breeds of horses, cattle, hogs, and chickens were successfully introduced, and the upbuilding of the different classes of live stock has been begun.

The appreciation of the work of the several stations is growing rapidly. In nearly every instance the support of the Territorial officials is quite cordially given, and the stations are often taxed

to their limits in supplying information, plants, etc., to the people for whom they are working. The published results of some of their scientific investigations are attracting attention and they are receiving wide publicity through scientific and review journals.

With the rapid development of their work the stations need additional buildings and funds for their support. The Hawaii Station needs a new laboratory building for its horticultural and agronomic work; the Porto Rico Station needs a plant laboratory where breeding, fertilizer, and other experiments can be carried on under controlled conditions; and a similar building is needed for the plant-breeding work in Alaska.

The popularizing of the stations' work through demonstration farms and other means is being rapidly extended, for the most part through funds contributed locally for this purpose.

ALASKA STATIONS.

The fall of 1911 was unusually prolonged, and as a result almost every variety of grain and vegetable planted at the several stations fully matured. Apples were ripened at Sitka, five varieties bearing fruit for the first time. The work of producing hybrid strawberries is being continued, and about 1 acre of land has been set to the best of the new hybrids. Other hybrid fruits have been produced and are under experiment to test their hardiness and quality.

The grain-breeding work at Rampart is being continued, and a number of new hybrid barleys of seemingly great promise are under observation. This breeding work will be continued and, as soon as possible, extended to include oats, to get varieties that have stronger straw to withstand winds and at the same time give larger yields of grain. Again it has been demonstrated that winter wheat suffers from the severe cold unless deeply covered with snow. The winter ryes came through much better and gave good yields. More attention will be given to growing winter rye as a staple crop. Plants of alfalfa obtained by Prof. N. E. Hansen in Siberia and northern Europe have been given a trial and have proved hardy for two winters at Rampart. These are being propagated as rapidly as possible to extend their use for forage and to increase the nitrogen of the soil, most Alaskan soils being deficient in this important element. At Fairbanks a very successful experiment in potato growing is reported. On 4 acres of newly broken land yields of 125 bushels per acre were obtained, and on 3 acres of land that had been previously cropped for two years yields of 200 bushels of marketable tubers per acre were secured.

The live-stock investigations on Kodiak Island have demonstrated the possibility of summer pasturing cattle and sheep and their wintering on hay and silage made from the native grasses. About 100 head

of purebred Galloway cattle and 100 sheep were carried through the winter entirely on native forage. Eleven cows with good milking records have been purchased to add to the herd, with the view of developing a milking strain of Galloways. The stock-breeding work received a temporary backset through the eruption of a volcano some 95 miles away covering the entire pasture and hay lands with ashes to a depth of 14 inches or more. This has necessitated the removal of the best of the cattle, and arrangements will have to be made for their future disposal. This will make a serious inroad on the resources of the stations and may require additional support during the year.

HAWAII STATION.

Some results of the work of this station in diversifying agriculture are begining to appear. The pineapple industry has risen to second rank among the industries of the islands, and the station's work on soils, pineapple breeding, etc., has contributed very materially to this extension. The effect of manganiferous soils on pineapple growing has been pointed out, and experiments are in progress that seem to promise good results in rendering the manganese less injurious when present in the soil. The work with cotton has been continued, the best results being obtained with some strains of Caravonica cotton. The station's crop was sold for 18½ cents per pound last season, and the buyers ranked it equal to the best Peruvian rough cotton. This form seems to respond better to perennial culture and is less subject to the attack of bollworms than any others tried by the station. The Japanese rices introduced by the station still give satisfaction, and it is probable that the importation of milled rice from Japan will gradually fall off, the locally grown product taking its place. The experiments with fertilizers have again shown the inability of the rice plant, as grown in Hawaii, to utilize nitrate of soda and the great superiority of sulphate of ammonia applied in the first stages of growth of the rice plant. Somewhat similar work with the taro plant shows that it is readily influenced by fertilizers and methods of culture. Continued work on the propagation of mangoes and avocados shows that when properly understood but little greater difficulty is experienced with their propagation than with ordinary deciduous orchard trees. Experiments in tapping Ceara rubber trees, collecting the rubber, and preparing it for market have been carried out and methods devised that are economically profitable. Rubber prepared by the method worked out was rated in New York as but little inferior to the best Para rubber.

The station's demonstration work that is carried on in cooperation with the Territory and private individuals is beginning to attract attention. Five such stations have been established, where attempts are being made to work out local problems and at the same time give

visual evidence of the results of scientific investigations carried on elsewhere. These demonstration farms, in conjunction with an effort in marketing carried on by the Territory, it is believed, will aid very materially in diversifying the agriculture of the islands.

PORTO RICO STATION.

The work of the Porto Rico Station has been continued along the original lines looking to the proper diversification of the agriculture of that island. The fruit industry is rapidly increasing in importance, the exports having increased in value from $100,000 in 1901 to over $2,350,000 in 1911. This rapid development has resulted in part at least from the horticultural investigations of the station, which have demonstrated the importance of windbreaks, choice of soils, proper handling of fruit, orchard management, etc. The introduction and propagation of improved varieties of tropical fruits is receiving much attention. Some of these new varieties have fruited and their superiority is plainly shown. Cover crops for orchards are being investigated with pronounced success. The introduction and planting of Eucalyptus trees is being continued, and varieties have been found that are making good growth on the higher and drier lands. The chemical work continues to be largely a study of soil problems. The effect of strongly calcareous soils in inducing chlorosis of pineapples, rice, and other plants has been demonstrated. The fertilizer requirements of the red-clay soils are being investigated, and the causes that result in the so-called "sick" soils are being sought with a view to their probable correction. The plant pathologist and the entomologist are devoting much of their time to coffee pests. The definite causes of several diseases have been worked out and means for their control are being sought. The entomologist is propagating and distributing beneficial fungi and insects for the destruction of certain insect pests. The experiments in the introduction of forage plants are being continued, and among the most promising new plants for this purpose are molasses grass, Rhodes grass, and *Paspalum dilatatum*. Some of these appear drought resistant, and it is thought they will prove valuable for pasture purposes.

The work in improving the live stock is making satisfactory progress. The station added a saddle-bred stallion and a young Morgan stallion to its equipment of stock during the year. The latter animal was secured by transfer from the Bureau of Animal Industry of this department. The number of cross-bred cattle is increasing steadily, and the station has begun the establishment of a dairy herd. At present the only experiment is the production of milk under proper sanitary conditions. The progeny of the half-bred Zebu bulls of the station are in great demand, as the calves are larger, hardier, and make more rapid growth than native-bred calves. The work with

swine was interrupted by the death of the entire herd from some infectious disease. The introduction of poultry is progressing rapidly, but the station is unable to meet all the demands for improved strains.

GUAM STATION.

One of the most important events in connection with the Guam Station was the arrival of the purebred live stock from the mainland. These consisted of 6 head of Morgan horses, 5 of Ayrshire cattle, 4 Berkshire hogs, and 8 each of Barred Plymouth Rock and Brown Leghorn chickens. After a trip of a month by transport from Seattle the stock was landed in very good condition. As a precaution they were placed in quarantine for a short period, after which they were transferred to the station. The oldest bull died in about a month with symptoms of tick fever. All the other animals escaped and are reported as growing finely. This stock will be used in an experiment to improve the native stock of the island.

The experiments with field and garden crops generally gave better success than in any previous year, due probably to the improved condition of the soil following cultivation. An extensive experiment with corn has been begun in an attempt to obtain a better yielding variety. This will embrace many tropical varieties, and as corn is a staple food of the island, the importance of its more abundant production is readily seen. The forage-plant investigations have been continued, and Para grass, which was introduced by the station in 1910, has proved well adapted to the island, and several wagonloads of roots have been distributed to natives for planting. It grows rapidly and quickly covers the ground with a thick sward. Experiments with *Paspalum dilatatum* and Guinea grass have continued, but they are surpassed by Para grass for almost every situation and use. Other field crops, including a number of leguminous plants, are receiving attention. Vegetables were almost without exception better in yield and quality than in any previous year. Experiments are in progress in planting vegetables at different times in the year to ascertain for each kind the most favorable planting season. A large number of new agricultural and horticultural crops have been introduced during the period the station has been in existence, and some have already shown their value in their new environment.

A preliminary entomological survey of the island was made by Mr. D. T. Fullaway, entomologist of the Hawaii Experiment Station, who was detailed for that purpose.

During the year the governor of Guam ceded to the station for its use 130 acres of pasture and other land adjoining the station.

IRRIGATION INVESTIGATIONS.

The results of the irrigation census taken by the Bureau of the Census in cooperation with the Office of Experiment Stations have

demonstrated four great needs of the irrigated West, namely, (1) more settlers; (2) information and assistance that will enable settlers, both old and new, to make a better and more economical use of their water supply; (3) investigations for the purpose of reducing the cost of pumping and storing of water, of preventing the losses and wastes in distribution and application, and of bringing about a higher duty of water in all irrigated sections; and (4) information regarding better methods of reorganizing irrigation enterprises and operating and managing irrigation systems.

The great need of the irrigated West to-day is not more projects but settlers for the projects that are completed or will be completed within the next few years. The period from 1899 to 1909 saw more than 6,000,000 acres brought under irrigation; yet, making a liberal allowance for the lands that will probably never be profitably irrigated, the enterprises on July 1, 1910, were able to supply water to more than half as much more land; and if the next 10 years is to see two-thirds of the area in projects but not irrigated in 1909 irrigated, 12,000,000 acres must be settled and irrigated. In the past the farming regions of the Mississippi Valley and the irrigated sections themselves have furnished a large percentage of the new settlers, but in the future projects must look more and more to the cities and more densely populated sections of the East for their settlers. The chief irrigation work of the department in the future, therefore, must continue to be the furnishing of information regarding the conditions and possibilities of the different irrigated sections, the cost of obtaining land and water, and the cost and best methods of preparing the land and distributing, applying, and conserving the water, as the success of the individual settlers and the development of the irrigated sections will depend largely upon the newcomers getting properly located, knowing in advance the problems and difficulties to be encountered, and being properly advised and assisted in starting and carrying on their new work.

The average cost per acre of irrigation systems increased 77 per cent and the cost per acre of operation and maintenance 182 per cent in the decade 1899–1909. Further irrigation development, except in comparatively few cases, will be possible only by the construction of still more costly works or by the installation of pumping plants. In but few sections is the water supply sufficient to reclaim more than a small part of the arable land, and thousands of acres of lands will never be reclaimed until a higher duty of water is brought about by the conservation of the flood and out-of-the-season flow of streams, by the introduction of better methods of distributing and applying water, and by the reduction of the waste and losses due to seepage, evaporation, and the applying of water in the wrong stages of crop growth. The data that have been collected and the experiments that

are being conducted by this office have demonstrated that with proper installation and operation irrigation by pumping is feasible in many localities and that a large part of the losses and wastes of irrigation water can be prevented at a cost that will render it profitable to do so.

More than 79 per cent of the area irrigated in 1909 is under enterprises managed by the irrigators themselves, and, judging by the trend of the past 15 years, more than 85 per cent of the irrigated lands will be under such enterprises when the projects being constructed at the present time by the Reclamation Service and Carey Act companies have been turned over to the settlers. Officials of cooperative companies and irrigation districts are constantly facing the complicated problems of organizing and financing enterprises and constructing, operating, and maintaining canal systems, and such advice and assistance as this office is furnishing along these lines is of great importance, especially in those sections where most of the land has been settled and brought under irrigation in the past few years. This work is also of special importance, since the directors of such enterprises, by adopting better rules and regulations governing the delivery and measurement of water and the charges for operating and maintaining systems, and by encouraging the use of better methods and practices, will become one of the most powerful factors in bringing about a greater and better development of the irrigated sections.

DRAINAGE INVESTIGATIONS.

PROGRESS IN FARM DRAINAGE.

Farmers are gradually coming to the realization that poor drainage of their cultivated lands is not an unavoidable condition, a permanent handicap imposed upon them by nature. The truth is being pressed upon them, not only that the condition can be remedied, but that the more intensive methods of cultivation which inevitably must be practiced in this country will ultimately compel them to drain their wet land in order that they may derive the largest returns from every foot of their cultivated areas.

The department, so far as the means for this work permit, is endeavoring to impress upon the agricultural interests of the country the economy of land drainage. It is attempting, among other things, to discourage the "hit or miss" methods of laying out and constructing tile drains, which methods not only are likely to result in total or partial failure in the particular tracts concerned but also tend to destroy confidence in drainage in general. A considerable part of the work along these lines consists in demonstrating to the farmer the importance of a careful preliminary study of the controlling drainage factors in the tract he desires to improve, and the necessity of intelligent design of the system and rigid superintendence of construction.

To carry out this work the department has stationed specialists in various parts of the country, particularly in the Southern and Western States, whose services are available to communities, organizations, and individuals who desire expert advice upon particular drainage undertakings. Much of this service is of a consulting nature, but where it seems desirable these representatives make detailed examinations of concrete propositions, sometimes making complete surveys and detailed plans, locating the drains upon the ground, and supervising the construction. These representatives also make inspections of tile drainage systems already installed, with a view to collecting reliable data as to their effectiveness under the conditions in which they operate. Experimental work is carried on under varying conditions of climate, rainfall, topography, and soil to determine the best practice in such details as depth, spacing, and size of tile, effective measures to prevent silting of drains, and the necessary provision for surface run-off. In the arid regions the investigations are designed to meet the peculiar problems presented by the rise of ground water, due to irrigation and the resulting accumulation of alkali at the ground surface.

To the extent that time and means have permitted, the existing tile drainage systems in southern Louisiana have been examined in the endeavor to account for the almost universal ineffectiveness of tile drainage that has hitherto obtained in that section. In every case it was found that efficient drainage was precluded either by defective design, faulty construction, or both. The attempt will be made in the near future to overcome the prejudice that has naturally resulted from those failures by supervising the installation of a number of tile drainage systems in that section.

In Alabama an inspection has been made of all the existing tile drainage systems in the prairie section. Four experimental tile systems have been installed, and the results so far observed indicate complete success of this method of draining where the system is properly designed and constructed.

The department has supervised the installation of a number of tile systems in Georgia and the Carolinas which have been highly successful in their operation.

In Maryland, particularly on the Eastern Shore, and in Virginia the service rendered by the department has resulted in an increasing interest in agricultural drainage, several highly successful undertakings of this nature having been carried to completion under the supervision of the representative assigned to that territory.

NUTRITION INVESTIGATIONS.

Particular attention has been paid to studies of the use of corn meal and its value in the diet in comparison with other cereals. On the basis of data gathered from experiment and experience, a bulletin

has been prepared which contains much information which should prove of value to the housekeeper and result in an even greater appreciation of this standard American food crop which can be used in the diet in so many ways.

Experimental studies have also been made of the relative nutritive value of different fats and oils commonly employed for table and cooking purposes, and of ways of using rationally this important group of energy-yielding foodstuffs. This work, which involves studies with the respiration calorimeter, has been undertaken in cooperation with the Bureau of Animal Industry.

As a result of the numerous experiments with cheese, a popular bulletin has been published dealing with the economical use in the diet of this food, which gives directions for its use in many ways and discusses its relative value in comparison with other food materials, the general conclusion being that cheese can be used in quantity in a great variety of ways and that it may be employed to replace meat when this seems desirable. Similar work on the nutritive and economic value of dried fruits has been carried on.

The experiments made in cooperation with the Bureau of Chemistry on the respiration and energy output of bananas during the active ripening period has been continued. The small respiration calorimeter designed for this line of work has proved very useful in securing data which are of great interest in connection with the studies of ripening fruit which the department is carrying on. The methods are applicable to the study of a great variety of problems of vegetable physiology of both theoretical and practical interest and such work should prove of much importance to those who purchase, handle, and market such products and to those who use them in the home as well as to investigators interested in technical questions.

Mention should also be made of the increasing demands which are made for publications and other information on the relative value of food and similar topics. Housekeepers on farms and in towns, teachers, pupils, and others turn to the department in increasing numbers for data on such subjects, and it is apparent that the interest is widespread and genuine. Indeed, this has developed into one of the most important activities of the nutrition investigations and is one of those by which the Department of Agriculture directly helps in the solving of home makers' problems.

OFFICE OF PUBLIC ROADS.

There probably was never a time in the history of the United States when the question of improved roads was under more serious consideration. The process of centralizing the control of highways has gone steadily on and each year sees an added number of States that have established the State highway departments. There remain

many perplexing questions in highway technique and in the plan of administration and finance for public highways. The work of the Office of Public Roads of this department has fortunately kept pace with the widespread demand for information and assistance in road matters.

OBJECT-LESSON AND EXPERIMENTAL ROADS.

There have been built during the present fiscal year 32 object-lesson roads under the direction of engineers from this office. Such roads include plain macadam, oiled macadam, bituminous macadam, gravel, sand-clay, and earth roads. The office has also supplied supervision for the erection of three bridges. Twenty-four object-lesson roads built during past years have been inspected for information to guide future work. Some of these roads are in good shape, some show lack of maintenance, but nearly all have proved a stimulus in awakening interest for better methods of construction. Eight sections of experimental roadway were constructed at Chevy Chase, in Montgomery County, Md. These sections were built for the purpose of determining the relative merits of different forms of bituminous material used as binders and dust preventives on macadam roads. A careful traffic census has been taken each thirteenth day since the completion of the work. It is planned to keep accurate records of the cost of maintenance of the various sections and properly to relate such costs to the traffic sustained by the road.

ECONOMIC INVESTIGATIONS AND MODEL SYSTEMS.

There has been an increasing demand for extended inspection by the engineers of the office in various counties. With a view to develop proper model systems of highways, engineers have been assigned to 24 counties. After thorough examination of existing conditions, detailed reports and recommendations have been prepared and submitted. It is necessary in this work to inspect thoroughly the entire county system; to determine the location and quality of road materials; to select the particular roads which carry the main traffic; to examine the financial resources and the plan of road administration and maintenance; and, wherever possible, to prepare maps and sufficient working drawings. Reports submitted to the authorities include all necessary details for carrying out proposed plans of improvement. This model system work has proved one of the most effective ways in which the Office of Public Roads has been able to impart information and render expert service.

SPECIAL INSPECTION AND ADVICE.

The office is frequently called upon by road officials and other administrative officers in towns and counties to supply quick advice

on various road matters. Twenty-three States and the District of Columbia have thus enjoyed the benefits of expert advice by highway engineers. Inspection of the State highways of New Hampshire forms the subject of a report issued as Bulletin No. 42, Office of Public Roads. The report treats of the existing conditions and materials, forms of construction, and special problems involved in New Hampshire highways.

INSTRUCTION IN HIGHWAY ENGINEERING.

Graduates in civil engineering from engineering institutions throughout the country may become eligible for appointment to the position of engineer student after passing the required examinations of the United States Civil Service Commission. Examinations were held on March 13 and 14, 1912, and from the register established 10 appointments were made. The students who come to the office in this way receive a thorough training in all parts of highway work in the field and in the laboratory. At the end of their first year many prove worthy and are either promoted to serve in the office or to suitable positions in county or State work. At the close of the second year junior highway engineers are eligible to promotion as highway engineer and may ultimately attain the grade of senior highway engineer.

PHYSICAL LABORATORY.

The laboratory for the testing of road-building stone has continued to be of large service. Samples have been received from 37 States and Territories, as well as from Canada, Porto Rico, and Wales. Research work in the physical laboratory has progressed satisfactorily and includes the testing of a large number of arch culverts in full-size sections. Studies on the subject of expansion and contraction of concrete while setting have proved of interest and results of value are anticipated when the work has further progressed. Observations have continued on the behavior of oil-mixed concrete, and a bulletin showing the progress of investigations has been issued.

During the year various papers were presented by members of the testing laboratory force on results of research work. A bulletin has been issued on the methods and results of physical testing of road materials.

CHEMICAL LABORATORY.

With the increasing use of bituminous materials in modern road construction, the services of the chemical laboratory have become very important. During the year 198 samples of oils, asphalts, tars, and other bituminous materials were received and tested for

their road-building qualities. In addition to the routine work of testing material, research work has been carried forward to determine improved methods of testing bituminous materials and the development of the necessary apparatus.

MAINTENANCE.

The attention of all highway engineers has been sharply drawn to the imperative need of better maintenance. Conditions brought about by the increased use of our highways under modern traffic have furnished conclusive evidence of the importance of continuous and adequate systems. An experiment in maintenance on earth roads has been in progress in Alexandria County, Va., on 8 miles of road. The system adopted here is the patrol system. The patrolman is further required to drag the earth road with a split-log drag after each sufficient rain. The results of the work so far indicate that the benefits of such systems can be realized in practice. Detailed information was accumulated as to the proportion of time which it is necessary to devote to the different necessary items of work and the cost of the same. There is a widespread lack of information as to maintenance cost. Considerable work has been done with a view to supplying this need, and it is hoped shortly to issue a bulletin entitled "Repair and Maintenance of Highways."

BOND ISSUES.

More and more counties and townships seem disposed to incur debt for road improvement, and it has accordingly become very common for bond issues to be made in amounts from a few thousand to a million dollars. Bond issues have increased so rapidly that the Office of Public Roads has undertaken an extensive investigation to determine the amounts of bonds issued for road and bridge purposes up to the year 1912. Studies are also under way on the methods of retiring bonds, the condition under which the issue is justified, the best method of financing repair of bond-built roads, and to settle the very serious question of relation between the life of the road and the term of the bond issue.

LECTURES, EXHIBITS, AND ROAD-IMPROVEMENT TRAINS.

During the year the office has continued its policy of presenting the proper methods of road building and maintenance by exhibits and lectures. The models of various kinds of road construction which are prepared in this office have proved of extraordinary interest and value to the public. Exhibits of models and enlarged photographs of road subjects have been made in cooperation with various railroads

in special cars on good-roads trains. Models have also been exhibited with pictures at various fairs and expositions. There has been a large demand for talks on good-road subjects. It has been possible to assign men for only part of this service. There have been a total of 1,135 lectures and addresses given. The total attendance at such meetings was 208,472.

RECORD OF SIXTEEN YEARS.

HISTORY OF THE DEPARTMENT'S SERVICE.

MANY SUBJECTS OF WORK AND ACCOMPLISHMENT.

Sixteen years have been of interest in the history of this department. Bureaus have been created and expanded. Lines of research, investigation, and demonstration have been multiplied. Congress has piled duty on duty from year to year. The corps of experts needed in the increasing amount and variety of service has grown greatly. The department has become a great agricultural university for postgraduate work. Discoveries for the benefit of farm practices and improvements of old ones have been countless. The department has both promoted and begun a revolution in the art and science of agriculture. Its influences for agricultural betterment have penetrated all regions of the national domain. At the close of a long administration, filled with accomplishments, it is fitting that the record of 16 years should be written.

EXPANSION OF THE DEPARTMENT.

EMPLOYEES AND APPROPRIATIONS.

Compared with present proportions, most of the department bureaus of 1897 were small, were getting small results from their work, and were confined to few lines of investigation and endeavor. The whole department had on its pay roll in that year 2,444 persons. The number grew to 6,242 in 1906, and rapidly increased to 9,107 in the following year on account of the enforcement of the meat-inspection law and expansion of work in forestry. The number has increased steadily since that time until on July 1, 1912, 13,858 were on the pay rolls of the department.

During the period under review the paid employees of the Weather Bureau have about doubled in number and are now 2,051. The employees of the Bureau of Animal Industry have increased from 777 to 3,311, and of the Bureau of Plant Industry from 127 to 2,128. The work in Forest Service was so small in 1897 that the paid employees numbered only 14. The number increased to 939 in 1905, to 2,012 in 1907, to 3,636 in 1910, and to 4,127 in 1912.

Only 20 persons were employed in the Bureau of Chemistry at the beginning of this period, and the number increased to 546. From 33, the employees of the Bureau of Soils, the number has increased to 159, and from 21 those of the Bureau of Entomology have increased to 339. The Biological Survey has 97 employees in place of 23 in 1897; the Division of Publications, 188 in place of 61; the Bureau of Statistics, 162 in place of 133; the Office of Experiment Stations, 209 in place of 38. In the Library 6 employees sufficed for the work in 1897 and now 29 are not too many. The Division of Accounts and Disbursements has increased from 10 to 66 employees, and the Office of Public Roads finds it has ample employment for 163 employees in place of 7 in 1897.

It has been a difficult matter to determine how many scientists and scientific experts are employed by the department. It is not always easy to certify that a person is or is not a scientist, but attempts have been made at times in the past, and it is a matter of record that from 1902 to 1907 from 1,927 to 2,326 scientists and scientific experts, assistants, and agents were employed.

Along with the increase in the number of the department employees it is to be expected that the appropriations of money by Congress for the use of the department would greatly increase. For the fiscal year ending June 30, 1898, the appropriations for the department amounted to $3,272,902. They increased to $7,109,682.62 in 1905; and by 1907 the amount had risen to $13,079,523.98. In consequence of the requirements of the enforcement of food laws and the care of the national forests, and in a less degree because of the general expansion of the work of the department, the appropriations by 1911 aggregated $20,888,449.28, and for 1913 the total amount is $24,743,044.81.

In wealth produced and in wealth conserved during these 16 years the department has returned to the Nation more than 10 times these appropriations.

PUBLICATIONS.

EVIDENCES OF GROWTH AND USEFULNESS

The publication work of the department is an unerring indication of its growth and usefulness. The records of the Division of Publications, in which such work is centralized, show that in 1897 the mail requests for publications barely exceeded 500 letters per week. So great has been the extension of the department's relations with the farmers of the country in the 16 years which have just passed that, during the past year, the weekly mail has exceeded 52,000 letters, or more than 100 letters for each one received at the earlier date.

With a printing fund of $116,888, the different publications printed in 1897 were 424, and the editions aggregated 6,541,210 copies; in 1912, with an appropriation of $470,000, the different publications were 2,110, aggregating 34,678,557 copies.

The work of the Division of Publications reflects, and must always represent, the activity of the other offices of the department. All the information acquired in the several bureaus by the means at their command finds its expression necessarily in the form of publications which pass through this office. Every enlargement of the scope of the work covered by any other office, especially the adoption of entirely new lines of work, involves an addition to the work of the Division of Publications.

The appropriations for the fiscal year 1897 disbursed by this division for salaries, supplies, etc., amounted to $44,367, while the appropriations for the fiscal year 1912, available for the same purpose, were $209,960, an increase of nearly 375 per cent.

In 1897 the number of employees in the division was 61, and in 1912 the number aggregated 197, an increase of nearly 225 per cent.

NUMBER OF COPIES DISTRIBUTED.

During the 16-year period over 225,000,000 copies of publications have been distributed to those engaged or interested in farming. Of this number slightly more than 88,000,000 copies were farmers' bulletins.

Although the series of farmers' bulletins was begun in 1889, only about 5,000,000 copies had been issued by 1897, and those distributed during that year amounted to less than 2,000,000 copies, while during the year 1912 over 10,000,000 copies were distributed. Previous to the period under discussion only 41 different farmers' bulletins had been prepared, and at this date there are 506 separate pamphlets discussing nearly every phase of modern farm operations.

No other Government issues as many publications as does the United States, and no executive department of this Government issues as many publications as does the Department of Agriculture in performing its function of acquiring and disseminating useful information in regard to agriculture. But the rapid increase in the population of the country and the great popularity acquired by the documents of this department have so augmented the demand that the department has not in recent years had an appropriation that permitted the printing of a sufficient number of copies to meet the demand.

Congress, however, has provided a solution of the problem by authorizing the superintendent of public documents to reprint and sell at a nominal price such documents as may be required. The enormous increase in the sales by that official of this department's

publications is surprising when it is remembered that millions of copies are distributed free, both by the Department of Agriculture and by Members of Congress. During the last fiscal year 171,866 copies were sold by the superintendent of public documents, for which he received $16,428.

The magnitude of the work of disseminating the vast fund of information so systematically sought and so scientifically verified is commensurate with the enormous advance made in the application of scientific knowledge to practical agriculture by the farmers of the country—a result in which the department has been a marked factor. The improved conditions on farms, the increased yields of crops, the suppression of animal diseases and improved methods of breeding, feeding, and selection of live stock, and the new varieties of fruits resulting from the department's labors as detailed and explained in its publications have added many millions to the wealth of the Nation.

PLANT INDUSTRY.

OUTLINES OF POLICY.

In one of the earlier reports of the present Secretary of Agriculture he set forth the policy with respect to plant-industrial work. It was stated that it would be the aim of the department to bring the scientist to the help of the people; to ascertain what imported crop plants might be produced in our country; to search the world for grains, fruits, vegetables, grasses, and legumes that might be found useful here; to secure new varieties of plants by breeding and selection; to control destructive diseases; to open new markets for plant products, and to improve methods of handling, shipping, and marketing things the farmer grew, especially the more perishable crops. Following is a brief review of some of the more important results accomplished along these lines:

In the earlier stages of the work a cohesive and effective organization was lacking. Twelve years ago the first steps were taken to bring all the forces together, resulting in the organization and development of the Bureau of Plant Industry. Little need be said about the methods and purposes of this bureau. Its work speaks for itself. It has no police or regulatory duties to perform; hence, the energies of its corps of nearly 1,500 laboratory and field men may be devoted exclusively to helping the 6,000,000 or more farmers in ways that have from time to time been set forth in these reports and which have brought about the things herein briefly recorded.

NEW CROPS AND NEW INDUSTRIES.

Since 1898, when the plant-introduction work was inaugurated, the department has actively pursued this field of study. At the present time the department has six important field propagating stations,

has brought in something over 34,000 plant varieties and species from every quarter of the globe, and has sent out the progeny from these introductions by the hundreds of thousands to experiment stations and private experimenters and plant breeders throughout the entire United States and its tropical possessions. It has kept a historical record of all these introductions and distributions and accumulated a most extensive collection of data bearing on new economic plants.

This is the first systematic attempt by any government to supply its bona fide plant experimenters on an extensive scale with the material out of which new plant industries can be built.

The department has originated the profession of agricultural exploration and has sent out as agricultural explorers 25 trained men whose search has taken them through many of the cultivated regions of the world and has already been the means of bringing to the notice of the American farmer many of the farm customs and practices of the centuries-old farm civilizations of other countries.

AIDING RICE FARMERS.

One of the earliest explorations undertaken in this field was for the purpose of aiding the rice growers of the Southern States. During the year 1898 and again in 1901 an explorer was sent to Japan, China, and India for the purpose of securing short-kernel types of rice better adapted to the conditions of southern Louisiana and Texas and more suited to the needs of the market, especially as regards milling qualities.

The great growth of the rice industry is a matter of history. Lands which 15 years ago were selling at the nominal price of two or three dollars per acre have come to have values of $30 to $50 an acre. The total output of rice in this time has increased from 96,886,400 pounds in 1896 to 637,055,556 pounds in 1911. Not all of this advance has been due to the department's introduction work, but the industry received an impetus at that time that has gone far toward making it what it represents to-day.

GRAINS AND OTHER CROPS FOR SEMIARID LANDS.

About the time an interest in rice was being developed another explorer was sent to Russia for the purpose of securing help in the matter of grains adapted to our northwestern semiarid regions. A large extent of territory in this section was yielding no valuable crop returns. As a result of this first exploration work in 1898, followed by a second trip in 1900, large quantities of drought-resistant durum wheat and other varieties of wheats, oats, and special cereals were brought in. The results of this work are found in the rapid extension

of the durum wheat throughout the northwest territory and the distribution and extension of the Swedish select oats throughout several of the Northwestern States.

The whole alfalfa question in the United States has been put on a new basis by the introduction of the Turkestan, Siberian, Arabian, and Peruvian alfalfas and the development of the hardy hybrid strains which grow in the Southwest throughout the winter. The introduced Swedish barleys have created a new situation in the barley-growing industry of Montana, Idaho, and California.

NEW FRUITS AND OTHER CROPS INTRODUCED.

The seedless grapes of Italy and Greece have begun to have their effect on the table-grape and raisin industries of the Pacific coast. The Bohemian horse-radish has supplanted the old variety in New Jersey as a better yielder and a better flavored sort.

The date palm has ceased to be a curiosity in the desert regions of the Southwest, and its cultivation is becoming an important plant industry. The dasheen, a root crop for the South, has proved its possibilities as a food producer and will probably rival the potato in the South for lands too moist for this staple crop.

The Chinese wood-oil tree, from the nuts of which the best varnish oil in the trade is produced, has fruited successfully in the Gulf States and promises a new crop for cheap lands which can be harvested during the slack-labor season.

The Chinese wild-peach stock has proved to be hardy in the Middle West in sections where the hardiest varieties heretofore known have been killed to the ground, and it also promises to be the earliest stock in California. Groves of the timber bamboo are now established in Florida and Louisiana.

Groves of the superior-flavored oriental mango, first encouraged by the department, are now fruiting in Florida, Porto Rico, and Hawaii, and this fruit tree is beginning to attract attention in southern California.

The Guatemalan and Mexican avocados and selected seedlings of West Indian and Florida origin are creating a new fruit situation in California and Florida.

The Smyrna fig industry of the Pacific coast is now established, and the introduction by the department of the insect-carrying caprifig has become a matter of history. Over 1,000 tons of this choice fig were produced last year.

The pistache nut of the Orient, together with its relatives from China and the Mediterranean region, have been introduced and proved valuable for Pacific coast conditions.

The introduced Chinese jujube has proved adapted to Texas and other portions of the Southwest, and a new dry-land fruit tree, comparable in a measure to the prune, has been added to our horticulture for semiarid regions.

The Chinese persimmon varieties have proved quite as well adapted to conditions in America as the Japanese varieties and are showing certain advantages over them. They have added a distinct new type of fruit to our fruit culture.

The cork-oak acorns, which were early introduced, have grown into large trees and have demonstrated the possibility of growing American cork.

EXPLORATIONS UNDER WAY.

During the past year an agricultural explorer was sent through the steppe regions of western Siberia, south of Omsk, to make a detailed study of the behavior of the yellow-flowered, hardy alfalfa on the cattle ranches there, and he made contracts with the peasants for all the possible seed for special experimental tests of this plant in the Northwest. He imported the Siberian bush cherry, which he believes will become important for the extreme northern tier of States, and the Siberian larch, which is the fastest-growing conifer of that region, together with several hundred dry-land grains, forage crops, and fruit-tree varieties.

As a result of a survey of the East Indian cattle-raising country, which the forage-crop expert of the department was sent to make, some promising Indian forage grasses were secured, which may prove valuable for the Southern States. An investigation of the Egyptian date region resulted in the introduction of new varieties of date palms for the experimental plantings in the Salton Basin.

A special effort has been made to secure plants from the dry and cold regions of central Asia, including the little-known Chinese Turkestan. This exploration work has been continued actively the past year. As a result of the establishment of a new plant station in North Dakota, at Mandan, it has been found necessary to look further for crops that may be brought in, established, and tested at the station, with a view to using them for breeding purposes and distribution throughout the entire Northwest to help the farmers of that region.

Numerous types of dry-land poplars and other trees suitable for wood, windbreaks, etc., have been located. Valuable shipping varieties of table grapes, hardy wild apples and apricots, and a number of wild forage legumes from the Siberian steppes have been located and are now being secured in quantities for distribution and testing in the years to come.

SPECIAL WORK ON FORAGE CROPS.

A great many valuable introductions have been made through correspondence and in ways other than through explorers. This is the case with forage crops for nearly all parts of the country. Sudan grass, a wild form of sorghum, although introduced only four years ago, is now greatly in demand in the southern portion of the Great Plains region on account of its ability to produce an abundance of good forage under conditions of low rainfall.

In Florida and the immediate Gulf coast region a good hay grass has long been a desideratum. Rhodes grass, secured from Africa, promises practically to solve the hay question for that portion of the South.

Renewed interest has been awakened in the soy bean by the establishment in general use of new varieties secured from China and Japan. These varieties have proved far superior to those originally grown. Likewise, new and improved varieties of cowpeas have been introduced and developed, thereby extending materially the usefulness of this very important crop. The origination of improved varieties of timothy by selection and breeding has opened up great possibilities along the line of improving the most important grass-hay crop for the United States.

Much attention has been given to the extension of alfalfa, and our efforts have met with marked success. At the present time this valuable forage crop is becoming a staple in many sections of the Eastern States and promises to increase rapidly in importance during the next few years.

During the past year marked advance has been made in the work with the hardy and drought-resistant alfalfas introduced from Europe and Asia. The crossing of the yellow-flowered form with the common species has resulted in some very promising hybrids adapted to use both as hay and for grazing in the Great Plains region. The value of the new alfalfa for hybridizing can scarcely be overestimated.

The increasing difficulty of obtaining and maintaining profitable stands of red clover has long been a matter of serious concern in many parts of the clover belt. Investigations started last season are already indicating the solution of this problem. Efforts to develop methods of handling the clover-seed crop in order to make it more certain are meeting with success.

Rhodes grass and Sudan grass have this season even surpassed expectations. Extensive seedings of both of these grasses have been made, so that there is now abundant evidence of their value under field conditions.

Work with the sorghums and other drought-resistant forage crops has continued to give results of great importance to the dry land of the West.

AIDING THE IRRIGATION AND DRY-LAND FARMER.

AID FOR IRRIGATION AGRICULTURE.

The past few years have witnessed remarkable growth in the development of agriculture in all that region lying west of the one hundredth meridian. The great irrigation projects undertaken by the Government and private agencies have stimulated an interest in agriculture to such an extent that the department has found it necessary to give help along many lines of crop production. To do this, investigational work was necessary.

This has been carried on, in so far as relates to irrigation agriculture, at eight field stations located in the Western and Southwestern States. All these stations, with two exceptions, are operated in cooperation with the Reclamation Service. The primary object of these field stations is to furnish investigational bases at which the various specialists of the Bureau of Plant Industry can work, with a view to getting an understanding of agricultural conditions and problems which characterize the different sections. They are also intended to facilitate cooperation in the solution of problems relating to irrigation agriculture, the improvement of existing industries, and the investigation and establishment of promising new industries.

In addition to the purely investigational work, a great deal has been done in fostering community action with respect to the development of industries especially adapted to the irrigated regions.

The major portion of the work at the field stations is still in progress, but some lines have been completed, and in these and other lines numerous specific results have been accomplished.

At the San Antonio field station it has been found that the ravages of the sorghum midge, which formerly did very great damage to the grain-sorghum crop, can be entirely avoided by the practice of early planting; that the utilization of indigenous fruit plants as stocks for cultivated varieties greatly improves the possibilities of fruit production in that region, because the native stocks are better able to withstand the conditions of soil and climate peculiar to the locality; that certain varieties of forage sorghums, winter oats, and annual legumes are very much more dependable as forage crops than anything that was generally grown in the section prior to the establishment of the station; and that one variety of Canada field peas, useful as forage, green manure, and as a winter cover crop, will successfully withstand the winter temperatures and produce a satisfactory yield.

An important part of the work at the Yuma field station, at Bard, Cal., is the experiments with Egyptian cotton conducted in cooperation with other offices of the bureau. It has been found that the methods of planting, cultivation, and irrigation as practiced in Egypt are not applicable to the southwestern United States. Upon the recommendation of bureau officials, about 700 acres of land were planted to the crop this year in cooperation with farmers on the Salt River, Yuma, and Imperial Valley irrigation projects, and two specialists have been detailed to supervise the field work of the cooperating farmers. The results so far are extremely encouraging.

The work on the Williston project in North Dakota consisted chiefly in giving expert assistance in the construction and use of farm irrigation systems to the new farmers who came to live on the irrigated lands. At the close of the present season it was found that the work had progressed far enough to enable the farmers to dispense with the services of the irrigation expert who had been maintained at Williston, and his employment was therefore terminated.

At the Fallon (Nev.) field station one of the chief problems has been the devising of methods for the reclamation of the highly impervious alkaline soils which comprise a large part of the Truckee-Carson project. Various methods have been attempted without success, but recent experiments strongly indicate the practicability of using gypsum or lime on the soil to increase its permeability and installing farm drainage systems to carry away the alkaline salts leached out of the soil by irrigation. One more year's results will be required before this method can be recommended with certainty.

Probably the most serious problem which has been encountered on the project is the eradication of the nematode gallworm affecting potatoes and some other crop plants. In 1910 and 1911 the disease was so extensive as seriously to threaten the potato-growing industry in Nevada. Investigation has shown that certain crops are seldom or never affected by the gallworm, and that the growth of these crops for a series of years affords about the only effective method of eradicating the parasite from infested areas. A publication giving suggestions for the avoidance and eradication of the pest was issued in February, 1912, and distributed among the farmers of Nevada.

A considerable quantity of educational work has been done on the project, not only with field and garden crops, but with ornamental plants for use in home making as well. Several thousand shade trees have been purchased and set out by the farmers under the direction of the farm superintendent, and excellent growth has been made, particularly by black locust and Carolina poplar.

The work at the Umatilla Experiment Farm, at Hermiston, Oreg., is comparatively new, but some few definite results have already been secured. It has been found that young nursery stock is very much more dependable for orchard planting on the Umatilla project than trees two or more years old. The experiments with winter cover crops have shown the superiority of the vetches for such purposes. There has been noted a decidedly depressing effect on the growth of the trees where alfalfa is grown in the orchard close to the trees.

DRY-LAND AGRICULTURE INVESTIGATIONS.

For the past 30 years there has been an ever-increasing interest in the agricultural development of the fertile plains extending from the base of the Rocky Mountains eastward for an average distance of about 300 miles and from the Canadian boundary on the north to the Gulf of Mexico on the south. This area is known as the Great Plains. It is in this area that dry farming has reached its most extensive, if not its highest, development.

The term "dry farming" is one that has come into general use to meet the need of a descriptive name for that type of farming which has been developed without irrigation in semiarid regions where irrigation is desirable but impracticable.

Prior to the year 1906 the department had carried on various lines of investigations in this area, dealing with some of the more important specific agricultural problems, such as grain and forage-crop investigations, but by this time it had become evident that if the agricultural problems which the settlers and home builders had to meet were to be solved there must be a much more comprehensive plan of investigation devised.

To meet this need the Office of Dry-Land Agriculture was organized and placed in charge of a man who had had long experience in this region both as a practical farmer and as an investigator at one of the State experiment stations. In the organization and development of the work the following objects were recognized as fundamental: To establish and maintain close personal contact with the actual settlers and their problems and to work out these problems under the same soil and climatic environment as that surrounding the settlers; to establish a sufficient number of field stations, so distributed as fairly to represent the area as a whole; to have these stations established on a permanent basis, so that the work would continue uninterruptedly through a long series of years; to have the work at all the stations so thoroughly coordinated that results obtained at each would be comparable with that of all the others; to enlist the active cooperation of the State experiment stations and of the various bureaus and offices of the department, of State, county,

and municipal organizations, and of practical farmers along all lines of investigation having a bearing upon dry-land farming.

With the above-mentioned considerations constantly in mind, the work of the Office of Dry-Land Agriculture has rapidly developed in the last six years, until it now has under actual operation or in process of development six fully equipped field stations under its own financial and administrative control, and provides field and laboratory facilities for many other cooperating investigators. These stations are located at Mandan, N. Dak.; Ardmore, S. Dak.; Akron, Colo.; Woodward, Okla.; Dalhart, Tex.; and Tucumari, N. Mex.

It is carrying on its investigations in cooperation with the Office of Western Irrigation Agriculture at three stations, namely, Huntley, Mont.; Bellefourche, S. Dak.; Mitchell, Nebr.; and with the Office of Cereal Investigations at Amarillo, Tex.

It is conducting its work in cooperation with the State experiment stations at eight stations, namely, Judith Basin, Mont.; Williston, Dickinson, Hettinger, and Edgeley, N. Dak.; North Platte, Nebr.; and Hays and Garden City, Kans.

At all of the above-named 18 stations investigations in crop rotations, cultivation and tillage methods, the conservation of soil moisture, and meteorological observations are being conducted in a systematized manner. In addition to these, many special problems are being studied through cooperation with other investigators.

If this work continues to develop in the future as it has in the past six years, it will result in the accumulation of a mass of carefully recorded and thoroughly coordinated scientific data based upon original investigations and having a direct bearing upon the fundamental agricultural problems of a vast area, such as has never before been undertaken, and the value of which to the present and to future generations can not be overestimated.

If this country is to continue to produce food for its own people with a surplus for export, all of the fertile semiarid lands must be made to produce some kind of food product, and this must be done without the fearful loss in ruined fortunes and wrecked lives which has accompanied the unsuccessful attempts in the past to develop the agriculture of some parts of this area. This can be accomplished by a thorough understanding of the problems involved, which can be gained only by investigations of this character and scope.

CROPS RESISTANT TO ALKALI AND DRY-LAND CONDITIONS.

Problems chiefly associated with irrigation and dry-land agriculture have to do with alkali resistance of various crops. The alkali resistance of numerous crop plants has been tested comparatively at field stations in the Western States, and the results have been supplemented by observations in northern Africa, where agriculture has

been carried on for many centuries in the presence of alkali. The data thus obtained have made possible definite recommendations regarding the crops best adapted to various types of alkali in the United States. Laboratory experiments during the same period have afforded much information concerning the relative toxicity of the different alkali salts and concerning the influence of alkali upon the utilization of soil moisture by plants.

Success in breeding crop plants for dry-land agriculture depends upon a thorough understanding of those features of structure and function which enable plants to cope with a meager supply of water. Recent field and laboratory investigations of the bureau have largely cleared up the obscurity surrounding this subject. Adaptability to dry-land conditions has been found to depend not, as has generally been supposed, upon superior ability to extract water from a dry soil, but, primarily, upon ability to manufacture a given quantity of dry matter with a minimum expenditure of water. The results of these physiological investigations are being practically applied in breeding drought-resistant strains of various crops for the Great Plains region.

The native vegetation on different types of land in the Great Plains and Great Basin regions has been studied in relation to the various factors of physical environment. The results prove that the composition and character of the natural growth is a reliable indicator of the capabilities of the land for crop production, reflecting with remarkable sensitiveness the average conditions with respect to soil moisture and the presence or absence of injurious quantities of alkali. These investigations indicate that the native vegetation can be used in the rapid and accurate classification of new land as (1) suitable for dry farming, (2) suitable for crop production under irrigation, and (3) nonagricultural.

PROGRESS IN COTTON WORK.

For the past 12 years systematic work has been carried on with a view to discovering fundamental principles which would aid the producers of the South in the matter of securing better types, larger yields, and varieties of cotton resistant to various diseases. The breeding work has resulted in securing numerous varieties which have taken their place among the people as standard sorts.

The advent of the boll weevil made it necessary to give careful consideration to the readjustment of cotton varieties throughout the invaded territory. This work led to discoveries of great importance in the matter of local adjustment, a hitherto neglected factor. It also developed the important fact of the serious deterioration of cottons by chance hybridization.

As a result of these several lines of work the importance of community action as a means of limiting the cotton grown in any particular region to a single variety has been shown. It has been further shown that the methods necessary to preserve a variety are totally different from the methods employed to develop new varieties. As the work of improving the types developed it became more and more evident that decisive steps had to be taken in the matter of aiding the producers of cotton in marketing their product.

With a view to bringing this about the department for a number of years conducted certain work directed toward bringing about improved conditions, especially through the establishment of national standards for American cotton. Recently those phases of the work dealing more specifically with handling and marketing have assumed such importance that an independent project has been established for their proper conduct

That the prevailing methods of distributing this great staple crop require radical improvement and simplification has been recognized for some time. The present methods are expensive and wasteful of fiber. They are so highly complicated that only the specialist middleman, very rarely the grower, is able to operate successfully in the selling end of the business. There are opportunities for inaugurating improvements all along the line from the time of picking until the staple reaches the spinner, but no one element in the industry acting alone can bring about the necessary changes.

The department inaugurated and is developing the movement toward cooperation in the matter of growing cotton and cooperation in the matter of marketing of the same. A study is being made of cooperative efforts in the handling of other crops, and educational work is being conducted in order to place in the hands of farmers the information necessary to enable them to organize for producing and marketing purposes.

ADVANCES IN CORN CULTURE.

The past 12 or 14 years cover history of great interest regarding the improvement of our most important crop. At the beginning of this period little concerning the improvement of corn had been recorded. Plant breeding attracted wide interest, and general attention turned suddenly to corn. All sections of the country were filled with descriptions of points that constitute fine-appearing ears of corn. By many careful workers these points were strictly adhered to for a number of years, resulting in demonstrating that in appearance corn is readily improved, but that fine appearance is not necessarily an indication of greater productiveness or profitableness.

When these facts were thoroughly established by practical field work, the general interest in "fancy point" breeding gave way to a

general demand for a method of corn improvement that would prove profitable. Our corn investigators in 1901 took up work under different environmental conditions to determine methods of corn improvement that would give profitable results. Methods of corn breeding and seed selection have been pursued during the past 12 years at these points with results proving that judicious breeding makes possible the production of much more profitable corn crops than can be otherwise obtained.

The methods of breeding that have proved most satisfactory are those that have been modified from time to time to suit the changing requirements of the strain of corn and its adaptation to its environment. It has not been by established methods, but by the constant exercise of good judgment that substantial and profitable improvements have been accomplished.

These demonstrations under various environments that by seed selection alone various varieties of corn can be rendered 25 or 50 per cent more productive, are serving to start corn-improvement work in many counties. Local features are so largely involved that much of the work must be accomplished by local enterprise, and where the possibility of substantial results has been demonstrated local enterprise is taking hold of the work so enthusiastically that the department has had more calls for leaders, plans of operation, and solutions of corn problems than it has been possible to supply.

The past year's work has added further proof that some of the many imported strains of corn having diverse characters and adaptations are proving of great value in localities in which their peculiar adaptations of drought or insect resistance are needed.

Because of its intrinsic value the corn crop is rapidly becoming linked with nearly all the leading enterprises of our country. It is now more than a question of growing corn. There are questions of kind and quality and methods of utilization to be considered from hygienic as well as financial viewpoints.

The demonstrations that have proved that profits are greatly increased by the application of methods of corn breeding, seed selection, seed preservation, judicious crossbreeding, etc., have returned financial values far in excess of the cost of making the demonstrations.

RESULTS OF THE TOBACCO INVESTIGATIONS.

In the tobacco work, which was inaugurated in 1898, it was apparent from the outset that the average yield and profit per acre from this crop were comparatively small, and it was found that this condition was due primarily to the growing of mixed and undesirable types, failure to follow sound cultural methods, particularly in the matter of crop rotation and fertilization, damage to the crop from

insects and diseases, and lack of understanding of the vital features of successful curing, fermenting, and handling of the leaf. All of these problems have been taken up, resulting in marked improvements in the old methods of tobacco production.

The old standard types have been improved by seed selection, and in the Connecticut Valley, Maryland, and Ohio new types have been produced by breeding which are much more productive than the old types. Desirable foreign varieties also have been successfully introduced, such as the Sumatra and Cuban wrapper leaf and the filler grown from Cuban seed.

It has been clearly demonstrated that in most of the export and manufacturing tobacco districts the continued growing of clean-cultivated, humus-depleting crops on the tobacco lands, with little or no attention given to soil-improving crops like the grasses and legumes, combined with improper methods of fertilizing, is the primary cause of the small yields of tobacco.

A great deal of hay has been imported into these districts each year, while practical demonstrations have shown that the growing of grasses for hay is just what is most needed on these soils to obtain the best results with tobacco. Our experiments and demonstrations have shown beyond doubt that the yield and value of the tobacco crop in these sections can easily be doubled by combining well-planned systems of rotation with the use of the proper quantities and forms of commercial fertilizers. It has also been shown that the growing of winter cover crops is highly beneficial to tobacco.

The fundamental principles of curing and fermenting have been thoroughly studied and practical applications of the results of these studies have been made in the cigar-wrapper leaf and flue-cured districts with striking success. It has been shown that the diseases and damage from other causes during the curing processes can be readily controlled by proper methods. Among the field diseases of tobacco which have been brought under control may be mentioned particularly tobacco-root rot, which formerly did much damage in some sections.

The tobacco work of the last year has followed along the same general lines as formerly. The work with the export types in Kentucky has been extended into Tennessee, with headquarters at Clarksville. The principal results obtained are the development of a very promising new type for the broad-leaf district of the Connecticut Valley, very large increases in yields of tobacco from improved methods of fertilizing in New York State and from crop rotation and fertilizer demonstrations in the manufacturing and export districts, and effective demonstrations in improved methods of curing in the flue-curing and in the Burley districts.

76397°—Ab. 1912—vol 2——35

PURE SEED FOR THE FARMER.

Great progress has been made in the matter of securing good seed for the farmer. The early laboratory work inaugurated has been gradually extended until the present time, and the laboratory located in Washington, together with the five branch laboratories maintained in connection with the State agricultural colleges and experiment stations, has tested more than 120,000 samples of seeds for purity or germination or both.

This work, continued from year to year, has resulted in a much better understanding of the nature and value of pure seeds and has added much to the upbuilding of agriculture. As a result of the information contained in publications on adulterated seeds the sale of adulterated alfalfa and clover seed has practically ceased, and the quantity of other adulterated forage-plant seed on the market is now small in comparison with what it was when these publications were undertaken.

Among the results to which the work of this laboratory and those of the State experiment stations have contributed is an awakened interest in better seeds on the part of farmers. This is evidenced by the steady increase in the proportion of high-grade seeds on the market each year. Seedsmen are now taking an active interest in seed testing. They are themselves learning to test seeds, and many firms have fitted up seed-testing laboratories of their own.

The seed-importation act passed at the last session of Congress will prevent the few unscrupulous seed dealers from bringing into the United States low-grade forage-plant seeds which do not find a sale in foreign countries, but which have previously been imported into the United States in considerable quantities.

During the past year the seed-testing laboratories have been continued. The work has been carried on along lines similar to that of previous years. The investigational work has been divided between studies on the physiology of germination and the critical examination of closely related seeds with a view to their easy recognition. Forage-plant seeds, including redtop and hairy vetch, have been examined for the presence of adulterants. Samples of seeds submitted for the purpose of analysis have been examined and reports on their quality have been made to the persons sending the samples. Branch laboratories have been opened in cooperation with the agricultural experiment stations in California and Louisiana, and those in Oregon, Missouri, and Indiana have been continued.

ARLINGTON FARM AND HORTICULTURAL INVESTIGATIONS.

The area developed as the Arlington farm was transferred from the War Department to the Department of Agriculture in 1900. The

improvement and development of the farm as a field laboratory for the Department of Agriculture was seriously started in 1900. Surveying, grading, and draining operations were begun the first year. Since then the present equipment, consisting of two dwellings, a large barn, shop, tool storage and boiler house, greenhouses, tool sheds, drug laboratory, and refrigerating plant, has been installed.

Previous to 1901 all the attention given to the vegetable crops originated in the Division of Pomology. Coincident with the development of the Arlington farm activities along the lines of market gardening, truck farming, and vegetable gardening were undertaken.

The Irish-potato investigations are to-day represented by a chain of field stations located in Maine, New York, Virginia, West Virginia, Michigan, Wisconsin, Minnesota, North Dakota, Nebraska, Colorado, California, and Idaho, which have been developed since 1903. Varieties of potatoes have been obtained from Europe and from South America, in addition to those common in the American trade, to test their disease resistance. Tests are under way to determine the adaptation of varieties to special localities for commercial purposes, as well as to determine those localities that can most economically produce seed of superior merit for regions which have to depend upon a foreign seed supply. The hill-selection and tuber-unit method of breeding potatoes for maintaining the vegetative vigor and productivity of our standard sorts has been improved and has given remarkable results in some regions where crop failures have been a severe blow to the potato industry.

The sweet-potato investigations, which were undertaken about the same time as the Irish-potato investigations, have resulted in determining the identity of varieties and have developed a method of utilizing the sweet potato for stock food which needs only to be carried to those regions where sweet potatoes can be cheaply produced. At the present time an effort is being made to solve the storage problems of sweet-potato growers.

The peanut investigations, which were begun in 1905, have proved of great advantage to the boll-weevil districts of the South by carrying to these regions a money crop of as great value as cotton, thus increasing the desirability of establishing a crop-rotation system. The invention of machinery that takes the place of hand labor in digging and picking the nuts has removed the industry from one confined to small areas, because of labor restrictions, to an industry which can be conducted on as extensive a scale as potatoes, beans, or other crops which require similar handling.

At the beginning of these investigations no peanut-oil industry existed in America. At the present time several of the cotton mills located in the peanut-producing area are installing machinery for the expression of peanut oil. Coincident with the expansion of the

peanut industry through the South, a remarkable extension of the use of the peanut both as a human food and as a stock food has developed. Single firms use as many as 150 carloads annually in the manufacture of peanut butter and confections.

PROGRESS IN POMOLOGY.

The fruit industries of the country are assuming large proportions. Their growth, especially during the past decade, has been rapid. The work of the department in this field has for its object the aiding of fruit growers along a number of important lines. Special efforts have been put forth in the matter of educational work in connection with the simplification of fruit nomenclature. As the interest in orchard and fruit planting develops, there is more and more demand for authentic facts relative to varieties. The identification, classification, and grouping of varieties have formed an important line of work and have been fully systematized and organized, to the end of helping fruit growers everywhere.

MAPPING OF FRUIT DISTRICTS.

Early in the development of the pomological work it was deemed important to inaugurate investigations in connection with the mapping of fruit districts. It was understood that certain kinds of fruit would succeed in one place and would not succeed in another. No very definite and specific information was at hand as to the factors governing successful fruit production in different parts of the United States.

Work along these lines has proceeded now for 10 years, with the result that some of the more important fruit regions of the Eastern States and the western central portion of the United States have been indicated. Last year this work was extended into Oklahoma, Kansas, Nebraska, northern Texas, and portions of New Mexico and Colorado.

FRUIT MARKETING, TRANSPORTATION, AND STORAGE.

One of the most important fields of effort in aiding the fruit grower has been in the direction of fruit marketing, transportation, and storage. These investigations have been pushed vigorously now for nearly a decade, with the result that in a number of sections of the country the handling, transportation, and storage of fruits have been practically revolutionized. This is especially the case in southern California, where the conditions affecting the fruit industry, including the cooperative-marketing organizations among the fruit growers, afford an unusually favorable opportunity to work out through experiments in orchards and packing houses the fundamental principles involved in fruit handling and storage.

Studies of transportation conditions pursued on transcontinental trains and in the receiving markets were also prosecuted. These studies have resulted in the development of that preparatory treatment of fruits for transportation known as precooling, which appears destined to play a very important part in the future development of transportation and storage of all perishable horticultural products.

The beneficial results of this work are already apparent in many fruit-growing sections of the country where, with some modification, the principles discovered in California have been applied in the commercial handling of fruits, including the orange and pomelo shipping in Florida and the peach, pear, grape, and berry shipping of both the Eastern and Pacific Coast States.

The viticultural industries of the country have been looked after in connection with the general fruit work of the department. Experimental vineyards have been established in California and elsewhere with the object of securing data relative to the governing principles in the matter of successful crop production.

A special effort has been put forth in encouraging the production of grapes in the Southern States, especially those of the Muscadine types. Nut culture has also received special attention in connection with the progress of the general fruit work. Studies have been made of the principal species of nut trees grown in the States east of the Rocky Mountains with a view to determining the adaptability of the varieties. Further studies have been made of the details of orchard operations with a view to advising and assisting those who are desirous of engaging in this industry.

SEED DISTRIBUTION.

It is gratifying to review the progress made in the securing and distribution of seeds by the department. By a combination of clear-cut business principles and scientific knowledge the work has developed smoothly along satisfactory lines. Within the last decade, ever since the work has been handled exclusively by the Bureau of Plant Industry, more than 7,000 tons of seed have been secured, tested in the laboratory and in the field, assembled, and distributed.

Early in the work it was determined to conduct it in such a way that all the seed secured and sent out should be of high quality. It was determined furthermore to eliminate costly practices of hand work and to introduce, wherever practicable, modern mechanical appliances for facilitating operations.

Notwithstanding the fact that the quantity of seeds secured and distributed has nearly doubled in the past 10 years, the actual cost of handling the distribution is less now that it was 10 years ago. The funds saved by good business management have gone toward improving the quality and quantity of the seed and have enabled

the department to take up a number of special lines which have resulted in much good.

Special features of seed distribution have been maintained, such as securing and distributing types of cotton better adapted to certain conditions in the South. Many of these types have been developed through breeding and selection. The extensive propagation of new types of citrus fruits adapted to home use has also been followed. Large numbers of citranges developed by the plant breeders of the department have been propagated and sent out under congressional distribution. Large quantities of special forage-crop seeds have been distributed in all parts of the country.

There is just now being put into effect a plan for the distribution of special seeds adapted to dry-farming conditions. The future success of dry farming in the semiarid districts will depend in large measure on the adaptation of suitable crops for these districts. An appropriation was made for this purpose at the last session of Congress, and special types of sorghums, wheats, oats, barleys, grasses, and legumes of various kinds will be distributed the coming year throughout the entire semiarid region.

In connection with the congressional vegetable and flower seeds there has been a steady improvement in the quality distributed, and that this has been appreciated is shown by the increased demand for them. That part of the congressional seed distribution covering vegetables and flowers for 1912–13 will require about 600 tons of material. These seeds will all be assembled, packeted, and distributed by the 1st of April, 1913. In round numbers, about 61,000,000 packets will be put up and mailed. In addition, there will be special sets of cotton seed and special sets of seed adapted to dry farming, as already indicated.

GRAIN GRADING AND GRAIN STANDARDIZATION.

The investigations pertaining to the conditions affecting grain crops after production, i. e., the methods of harvesting, transporting, grading, and marketing grain, have been productive of excellent results. During the year approximately 25,000 samples of grain have been tested and analyzed. Tests for acidity, which denotes soundness, were made of over 5,000 samples of corn. Stock-feeding tests are now being conducted in cooperation with the Bureau of Animal Industry, to determine whether or not corn of high acid content is detrimental to stock as food.

Definite progress has been made in determining the changes which take place in grain while in storage and in railroad and ocean transportation, special attention having been given to causes and degree of deterioration and actual shrinkage as influenced by moisture content, soundness, and climatic conditions. It has been determined that

excessive moisture is the most dangerous factor in handling commercial grain and that the artificial drying of corn increases its keeping qualities. Milling and baking investigations and grain-dockage investigations have been prosecuted vigorously.

Among the most important experiments being carried on at this time are tests to determine the effect on grade and the commercial and feeding values resulting from the artificial bleaching or "sulphuring" of oats. Satisfactory cooperation with grain-carrying railroads, commercial grain exchanges, grain dealers' associations, grain elevator companies, etc., has been had throughout the year, and this has contributed largely to the success of the work.

Since the organization of this investigation in 1906 an enormous amount of work has been done, including many special experiments and the testing of approximately 100,000 samples of grain. On arrival at European ports 183 cargoes of American corn have been examined, and the results of the examinations have been published, while 9 cargoes of export grain have been accompanied from the United States to foreign ports and observations and tests made of them. Sufficient data are now available to establish standard grades for corn.

DEVELOPMENT OF THE BEET-SUGAR INDUSTRY.

The beet-sugar industry has practically grown up during the period covered by this report. There are now in operation 66 factories in 17 States, which required and used for the past season 5,062,333 tons of beets from 473,877 acres. It is estimated that the output of sugar from these factories the present year will be close to 700,000 tons, the largest yield in the history of the industry in this country.

The department has demonstrated the applicability of the American soil and climate to this crop and has shown the benefits that have accrued to our agriculture from its establishment. The most favorable localities have been pointed out, the growers given instructions for caring for their beets, and the general progress of the industry fostered.

The diseases of the sugar beet have been studied and the causes of a number of them have been worked out and satisfactory remedies suggested.

The production of American sugar-beet seed has been an aim of the department for years. It has been demonstrated that seed of good quality can be produced here, American strains have been bred, and the commercial production of beet seed is now in sight. In connection with this work field laboratories have been established with analytical and other facilities and experiments with cultural methods have been carried on, particularly in the irrigated districts of the West.

Much has been done to improve farm practices there and to put beet culture on a permanent and rational basis. In conclusion, it is safe to say that the beet-sugar industry is now one of the mainstays and chief supports of agriculture under irrigation in this country.

PROGRESS IN PLANT PHYSIOLOGY AND PATHOLOGY.

As indicated at the outset of this statement regarding the work of the Bureau of Plant Industry, one of the fundamental lines of work which the present Secretary had in mind was a study of the diseases of crops, with a view to outlining specific remedies for the same. Much progress has been made in this work not only so far as the department is concerned but throughout the country as a whole. The plant pathological work of the department is now on a firm foundation. Our leading pathologists have developed lines of work which have been epoch making in their nature.

PROBLEMS IN PLANT PATHOLOGY.

The cause of the crown-gall of plants has been determined, and it has been discovered that this disease resembles animal cancer in its manner of growth and is due to bacteria lodged inside certain of the proliferating cells.

It has been proved that infection of Stewart's bacterial disease of sweet corn is produced by means of seed corn; that the black rot of crucifers, the brown rot of potatoes, the wilt of cucurbits, and other bacterial diseases are distributed by insects and slugs; that tobacco wilt is spread by nematodes; that bacterial infection can take place through stomata in the absence of wounds, as in the case of the black spot of plum, a disease of sweet corn and broom corn, and other plant diseases; that acid canes are resistant to the bacterial disease of sugar cane; that many bacteria, including *Bacillus typhosus*, are readily destroyed by freezing; that the Granville tobacco wilt is identical with the bacterial brown rot of potato, eggplant, and tomato, and hence these plants should not be used in rotation.

The cause and remedy of the olive tubercle disease, coconut bud rot, bacterial mulberry blight, and a new knot disease of citrus trees have been discovered.

It has been shown that the cause of a large part of potato rot is due to *Bacillus phytophthorus*, and that the rot is arrested in tubers stored below 8° C.

FOREST PATHOLOGY.

A general pathological survey of the National Forests has been made as a preliminary to active investigational work. Extensive experiments have been inaugurated for controlling forest diseases by the improvement of forest hygiene, chiefly by the method of

eliminating trees affected with dangerous diseases at the time of timber sales.

Very valuable results have been secured in the control of diseases of forest nursery stock. The leaf blight of young conifers has been shown to be readily controlled by slight modifications of prevailing nursery practice, particularly in connection with irrigation. The damping-off of forest-tree seedlings has been controlled by the use of soil fungicides, particularly by sulphuric acid. The white-pine blister rust has been destroyed wherever found, and the work on this disease has been largely responsible for the passage of the present plant quarantine act, which should prevent its further introduction.

Cooperation is in effect with 11 States in the investigation and control of the chestnut-tree bark disease, the most destructive of all tree diseases, and the work of checking its progress through methods worked out by this department is being vigorously prosecuted.

One important branch of the forest pathological work is the study and control of the diseases of shade and ornamental trees and shrubs. There is a great and growing demand from the general public for information in regard to such diseases.

DISEASES OF FRUITS.

The effective control of pear blight, one of the most serious diseases affecting pomaceous fruits, has been accomplished through eradication methods and has resulted in the saving of millions of dollars to pear orchardists on the Pacific coast and in other parts of the country.

Apple bitter-rot, a disease which has been responsible for immense losses to apple growers, has been shown to be easily and completely controlled by proper spraying with Bordeaux mixture.

A number of other apple diseases, such as scab, leaf-spot, powdery mildew, and blotch, have also been successfully controlled by spraying. Partial control of apple cedar-rust has been accomplished by cutting down the cedars and by spraying.

With the exception of bitter-rot, it has been found preferable to spray for the early treatments of apple diseases with lime-sulphur solution, using Bordeaux mixture for the later treatments. This practice has resulted in less russeting of apples from copper poisoning and has not reduced the effectiveness of the treatment.

Investigations have been carried on in connection with a number of physiological diseases of fruits, particularly of the apple, including apple bitter-pit, a disease producing corky spots in the Ben Davis and York Imperial apples, and the Jonathan fruit-spot. In the latter the trouble has been remedied by early picking and prompt storage.

The problem in connection with peach diseases has been to find a spray solution that would not injure the peach foliage. This has been brought about by the discovery of the self-boiled lime-sulphur solution, which has been demonstrated to be an effective remedy for the control of the destructive brown-rot and also of peach scab. A disastrous blight of peaches in California, due to a gumming fungus, has also been brought under control by late fall or early winter spraying with fungicides.

A number of serious fungous diseases of the cranberry have been investigated and effective methods of control devised. A satisfactory method for the treatment of grape anthracnose, a very destructive malady of both fruit and vine, has been demonstrated, and a remedy for black-rot perfected. Among the nut diseases, a remedy for pecan scab by spraying has been worked out.

A serious contagious disease belonging to the peach-yellows group, known as "little peach," has been discovered and described and a practical method of control by eradication developed. This was at one time a dangerous disease in the Michigan, New York, and New Jersey peach belts.

The fruit pathological work has been strengthened through the institution of thorough, systematic spraying demonstrations in orchards and vineyards in various parts of the country. In this manner methods of treatment of fruit diseases have been brought home to the farmer and the value of our research discoveries has been greatly increased.

DISEASES OF COTTON, TRUCK CROPS, AND SUGAR BEETS.

The cause of a group of destructive wilt diseases of cotton, cowpea, watermelon, tomato, and other plants in the Southern States has been found to be root and stem infecting fungi (*Fusarium* spp.) and a practicable method of control developed through selection and the breeding of disease-resistant varieties.

Advances have been made in our knowledge of the cause and control of a number of potato diseases, the most serious of which is potato wilt, causing premature ripening followed by dry-rot in storage. Methods of treatment for blackleg and early and late blight have also been determined, and the cause ascertained of leaf-roll, a destructive disease of potatoes in the West.

The asparagus-rust problem has been solved by breeding resistant varieties. Truck growers have been shown, by spraying demonstrations, how to control the destructive blights of cucumbers, cantaloupes, celery, and other crops, and how to manage their soils to escape malnutrition troubles and at the same time to produce more crops with less fertilizer. A general investigation has been made of dry-rot, stem-rot, and other diseases of sweet potatoes, and remedial measures have been recommended. Tobacco root-rot,

tomato wilt and rot, a number of ginseng diseases, and the whole group of nematode diseases have been studied critically and control measures introduced.

Leaf-spot and curly-top, two important diseases of sugar beets, have been thoroughly investigated, and better methods for combating them have been pointed out. Similar work has been done in connection with the damping-off and root-rot of sugar beets.

SOIL-BACTERIOLOGY AND PLANT-NUTRITION INVESTIGATIONS.

Satisfactory methods for isolating and distributing nitrogen-fixing bacteria for improving leguminous crops by inoculating the seed or the soil were discovered. Tests in cooperation with thousands of farmers throughout the United States have shown that such crops as clover, alfalfa, vetch, peas, and beans are often doubled or trebled in value by pure-culture inoculation. During the past five years the efficiency of the cultures distributed to farmers has been approximately 75 per cent.

The copper-sulphate method for destroying objectionable algæ in city water supplies without lowering the safety of the supply has been discovered and practically demonstrated. This method has become standard practice in sanitary engineering and is recommended by the leading sanitary experts. It was found that copper sulphate could be used in water supplies as an agent for killing dangerous germs, such as those causing cholera and typhoid. Simple directions for improving farm water supplies have also been formulated.

Extensive bacteriological studies to explain the variation in soil fertility have been undertaken, and during the past year the classical ideas regarding the decomposition of cellulose, which is considered a fundamental substance in humus formation, have been found to be erroneous. Many new and important species of soil bacteria that dissolve cellulose are under investigation, which are expected to make possible more suitable farm practices for maintaining soil humus.

WORK ON DRUG PLANTS.

It has been shown that many valuable drug and related crops can be successfully grown in favorable regions throughout the country. The culture of golden-seal and paprika peppers has been successfully established. Camphor culture has been introduced in Florida, with results sufficiently promising to attract private capital on an extensive scale.

The culture of American tea has been introduced in a demonstration experiment now yielding an annual crop of 14,000 to 16,000 pounds of high-grade tea, all of which finds a ready market in competition with imported teas.

Hop investigations have been productive of valuable results in demonstrating the causes of failure to produce the best returns in yield and quality, and have also led to the recommendation of rational criteria for judging hops on the basis of their properties and constituents rather than their geographic origin, with the hope of removing certain forms of discrimination now made against American hops in the trade. Improved foreign varieties are being introduced and progress made in the improvement of the yield and quality of American hops.

Studies of oil and perfumery plants have included the planting of 40 varieties of roses of imported types yielding the valuable rose oil of commerce and the development of good commercial values from raisin-seed waste and other oil-yielding residues, as well as from a number of neglected plants. In this connection a new turpentine substitute and a new linseed-oil substitute have been demonstrated.

POISONOUS-PLANT STUDIES.

Loco weeds, larkspur, wild lupine, death camas, and other poisonous plants have been responsible for enormous losses of stock in the grazing regions of the West. These losses have been greatly reduced through botanical surveys, and field and laboratory tests of suspected plants, so that it has been possible to point out the harmful plants, to recommend methods of avoiding poisonous-plant areas at the most dangerous period of growth, and to devise and indicate methods of treatment, antidoting, etc.

PLANT PHYSIOLOGICAL INVESTIGATIONS.

Advances in agricultural science have necessitated the broadening of the work in physiological investigations to meet the demands for fundamental knowledge of plant activities. The following are some of the results of these studies: An accurate method for measuring the oxidase content of plant juices, which has particular application in determining physiological phenomena accompanying many types of plant diseases; increased knowledge of the physiological conditions affecting the keeping qualities of sweet potatoes in storage and a consequent avoidance of the heavy annual losses from their rapid deterioration; a better understanding of the inorganic food requirements of plants and of the influence on plant development of various ratios of these inorganic constituents; and additional light upon existing confusion as to the toxicity of certain molds occurring in spoiled foods and the harmlessness of others of the same group, as the result of a study of the metabolism of molds and of the conditions under which they elaborate toxic products.

PROGRESS IN DEMONSTRATION WORK.

COOPERATIVE DEMONSTRATION WORK IN THE SOUTH.

The demonstration idea has been a feature of the work of the Bureau of Plant Industry since its organization. Even before the plant work was coordinated, demonstrations were a necessary adjunct to research work on plant diseases, notably those of the grape and the potato. Early in 1903 the advent of the cotton boll weevil in the South made it imperative that steps be taken to meet its ravages through some cooperative effort on the part of the farmers.

Out of the various preliminary steps that must necessarily be taken in a work of this nature there developed a few years later the Farmers' Cooperative Demonstration Work. Briefly stated, the object of this work was to bring home to the farmer on his own farm certain fundamentals which would enable him to grow cotton despite the weevil, and also to point the way for him to diversify his crops and build up his land. It was found essential that the farmer should be taught self-reliance and to help himself in so far as related to the practices of the farm. Any effort made to help the farmer by mere object lessons in which he did not actively participate was found to be a failure.

As the work progressed the demand for it rapidly increased. At the close of the fiscal year 1906 there were employed 25 agents having under their supervision more than 2,000 demonstration farms, and in addition more than 3,500 cooperators were receiving instructions from the department. The demand now arose for more intensified work. Each field agent's territory included several counties, and he could at most personally supervise not more than three or four demonstration farms located near the principal railroad centers in each county. In several counties business men and leading farmers now offered to contribute toward the salary of an agent to devote his entire time to their county. In the season of 1907 such cooperative plans were arranged for a county agent in six counties in eastern Texas and two in western Louisiana. The results in such counties were so satisfactory that the county agent was henceforth considered a necessary addition to the plan of organization. Since that time no material change has been made in the plan, which includes a special agent in charge, with a staff of assistants and a clerical force, a State agent, and from two to four district agents in each State, and generally a county or local agent in each county in the State.

It is not too much to say that this work has revolutionized the agriculture of the Southern States. It has given the farmers a new outlook and has shown them the great possibilities of the land. The scope of the work has been gradually enlarged from simple demon-

strations in cotton culture to a comprehensive system of instruction in general agriculture, including the organization of boys' corn clubs and girls' canning clubs.

The extensive growth of this work from its small beginning may be appreciated from the fact that at the end of the fiscal year 1912 the force of agents conducting demonstration work in the field was 858; something like 35,000 farmers were enrolled as demonstrators and about 67,000 additional farmers were listed as cooperators in the department's methods. Enrolled in the boys' corn clubs were approximately 68,000 boys, and in the girls' canning clubs 20,000 girls. From its inception the work has been on a cooperative basis. Merchants and business men supplied seed and fertilizer for the cotton-culture farms, even during the earliest years of the work, and farmers did the work. With the growth of the plan of supplying local or county agents, business men and commercial bodies, in order to secure the services of such local or county agents in their counties, began to assist in paying their salaries. Cooperative relationships have been established with agricultural colleges, boards of agriculture, and county organizations.

The department is now spending something like $600,000 annually in the work throughout the Southern States, about half of which is appropriated by the Government, while the other half is contributed by State and private agencies. It is believed that the permanency of the demonstration work on the southern farms is assured, as its efficiency has been thoroughly tested under various conditions; it is attracting wide attention, and the plan is being rapidly adopted by agricultural colleges, business organizations, railroads, and other agencies doing propaganda work. Within recent years representatives from many foreign countries have been sent into the South to study the practical workings and efficiency of the system.

FARM-MANAGEMENT INVESTIGATIONS.

Early in the development of the work of the Bureau of Plant Industry it was seen that some coordinating agency was necessary to bring together and apply to the individual farm the results of many special lines of investigation under way. Growing out of this need was developed the Office of Farm Management, which was established eight or nine years ago. The work of this office began with a detailed study of the methods and practices actually in use on various farms of the country. Special attention was given to the study of those farms that were most successful for the purpose of comparing them with those less successful, the object being to learn the reason of success in one case and of failure in the other under similar circumstances.

This work, at first more or less general in character, has developed into a detailed study not only of methods and practices generally in use, but also a study of farm organization and the coordination of related enterprises on the farm into such a system as will give the greatest return from the farm. Some of the special lines now in operation are as follows:

Farm bookkeeping.—Because of the importance of adequate methods of keeping the accounts of the farm a great deal of attention has been given to this subject. The results to date have just been published in Farmers' Bulletin 511, entitled "Farm Bookkeeping."

Cost accounting.—This is a study of the actual cost of operations on the farm and over 100 farms are now cooperating in keeping the actual time spent in the smallest details of every operation performed on the farm.

Farm-management surveys.—Farm to farm surveys of typical agricultural areas are being made to determine what returns are being received for capital and labor on the average farm of each type. At the present time the records of about 4,000 farms have been gathered, some of which have already been published, while others are being tabulated and prepared for publication.

Farm equipment.—A detailed study of the equipment of the farm is being made on a large number of farms for the purpose of learning what is an adequate equipment for farms of various types.

FARM-MANAGEMENT FIELD STUDIES AND DEMONSTRATIONS.

The result of the investigations of the past few years is that a vast fund of information has accumulated which the farmer needs and which he is entitled to have. The means of getting this information to the farmer in such a way that everyone may understand it has been the cause of considerable thought on the part of those who have charge of the work. Bulletins have been issued, but for various reasons failed to reach the farmers as effectively as had been hoped. Later, demonstration farms were established with a view to bringing into each community as an object lesson a farm properly equipped and managed. This plan also fell short of what was expected of it. Later, the plan of placing in each county or local area agricultural agents, whose services would be free to every farmer in the locality, has been established and is rapidly developing. The duties of the county agent are as follows:

To acquaint himself as rapidly as possible with the general agricultural conditions of the locality, study the various types of soils, the crops that have been found to be best adapted, and the types of farming that have been most successful on each type of soil.

To spend his entire time in the interests of improved farming in the section, studying the methods and practices of the most successful farmers who are following the various types of farming; to visit the farmers on their farms, study their plans, and aid them in formulating better plans.

To study every phase of all the farms he visits, so that he may know what methods, crops, and systems are best for the locality, and at all times, wherever he goes, to give the farmers the benefit of the information he gets, including the results of scientific investigations conducted by the various experiment stations and the United States Department of Agriculture relating to all kinds of farm practice.

The first of these county agencies was established in Bedford County, Pa., three years ago. Agricultural conditions were at a low ebb. Reports for the past season show that 8,000 acres of corn have been grown by improved cultural methods and the use of selected seed, with an average increased yield of 5 bushels per acre; 6,400 acres of clover from inoculated northern seed; 1,500 acres of soy beans, a crop wholly unknown before this work started; 200 acres of rape for hog pasture, replacing either grass pasture or none; and 300 acres of alfalfa. No attention had ever been given to the apple crop before this work began. The orchards were neglected. Now the trees are being pruned and sprayed under the agent's direction, and the fruit is carefully graded, packed, and shipped under label. This affords an instance of where a latent industry may be developed under this plan. The value of the results of improved methods in this county for the past season is not less than $135,000.

The next county agent was located in Broome County, N. Y. In this case the Binghamton Chamber of Commerce and the Delaware, Lackawanna & Western Railroad are cooperating financially toward the work, which is directed jointly by the New York State College of Agriculture and this department.

This method of cooperation with business organizations has met with general approval, and the demand for this work is far beyond the ability of the department to meet. At the last session of Congress $300,000 was appropriated for this work. There are now about 75 county agents in various parts of the country, and others will be established as fast as means and competent men can be had.

The methods of cooperation here mentioned are similar to many that have since been established. In every case the work in the State is conducted in cooperation with the agricultural college or experiment station, either with or without aid from other organizations.

ENTOMOLOGY.

EXTRAORDINARY GROWTH OF SERVICE.

Sixteen years ago the entomological service of the department was ranked as a division, and it had on its rolls 21 employees; the statu-

tory roll amounted to $9,500 per annum, and the lump fund to be spent for investigations was $20,000.

At the present time the service ranks as a bureau and carries more than 500 employees upon its rolls. The amount paid for statutory salaries is $58,750 per annum, and the total annual appropriation is $672,340.

Sixteen years ago the work was entirely carried on in three or four rooms in the city of Washington; members of the force visited the field from time to time, but there were no field stations.

At the present time the bulk of the work is done far away from Washington. The bureau has 35 field laboratories scattered all over the United States, and nearly all of them admirably fitted for sound investigation work upon certain particular insects or groups of insects most advantageously to be studied at the individual stations.

It may reasonably be supposed that the extraordinary growth of the service, just as with other branches of the department, has been facilitated by Congress upon recognition of the practical results achieved by the work which has been done. Some of the good work carried on may be mentioned briefly.

IMPORTATIONS OF INJURIOUS INSECTS.

Just 16 years ago the bureau began to study with extreme care the question of the accidental introduction, by means of commerce, of injurious insects from other countries. It was realized that about one-half of the injurious species of first-class importance had been so introduced, and in consequence not only was begun the study of other species likely to be imported, but a quarantine and inspection bill was drafted and put before Congress from time to time from 1897 down to the Congress of the winter of 1911–12. Passage of an act of this character was warmly urged by the department during all those years, and the passage of such a law by the last Congress is a measure which will undoubtedly prove of great benefit to the country.

SAN JOSE SCALE.

During the early part of this 16-year period the San Jose scale, which had recently made its appearance in the East and threatened the destruction of eastern orchards, was carefully investigated by the bureau, and its final report on the life history of this destructive scale has remained as a standard. Later the country of origin was discovered by an employee of the bureau, Mr. Marlatt, and from that country (China) he sent over a predatory enemy of the scale, which was reared in confinement at Washington and subsequently liberated in orchards in different parts of the country.

It is true that the success of the lime-sulphur wash as a winter treatment for this scale has obviated the necessity for a competent natural enemy to a large extent, but it is believed that this enemy is still living in parts of the South.

MEXICAN COTTON BOLL WEEVIL.

The Mexican cotton boll weevil received some attention at the hands of the department prior to the 16-year period under consideration. At that time it was confined to the State of Texas, and, inasmuch as the State itself appropriated a sum of money for its investigation, to be carried on by the State entomologist, the department turned the matter over to the station authorities for a time.

In 1900, however, it appeared that the problem was so great as to demand every possible aid, and, with congressional appropriations, the entomological service of the department entered once more upon the investigation and has continued it until the present time. In the course of this investigation probably the most intensive study ever made has been carried out in regard to the boll weevil. Every phase of its life history and activities has been gone into with the utmost particularity.

As the result of these intensive studies, while no actual and radical remedy of an exterminative character has been found, a system of cotton-plantation management has been developed, based entirely on these studies, which enables the planter to grow good crops even in the presence of the weevil. This has been put into effect with great success by the southern farm demonstration service of the Bureau of Plant Industry. Incidentally other insect enemies of cotton have been studied during these investigations.

FIG WASP.

Following the sending to California from Algeria by Mr. Swingle, of the Bureau of Plant Industry, of the fig wasp (*Blastophaga grossorum*), this insect, upon whose relations with the flowers of the Smyrna fig the production of the Smyrna fig crop is dependent, was established in California under the management of an agent of the Bureau of Entomology, and this establishment is responsible for the present Smyrna fig culture in that State and of its future culture in other States.

GIPSY MOTH AND BROWN-TAIL MOTH.

The gipsy moth and the brown-tail moth, two insects accidentally introduced into New England, became so abundant and destructive in 1905 as to call not only for large State appropriations but for governmental aid. Realizing the hopelessness of exterminative work after these pests had gained a firm foothold over 4,000 square miles

of territory, Congress appropriated to the department a sum of money to be used in the effort to prevent the spread of both gipsy moth and brown-tail moth.

During the years in which this appropriation has been made, the bureau and the different States acting in cooperation have succeeded in preventing any extensive spread and in making the conditions of the towns and villages within the infested territory perfectly livable, whereas previously both species had been enormously destructive and very annoying.

During that period further extensive importations of the parasites and natural enemies of the gipsy moth have been made from Europe and from Japan, and of the brown-tail moth from different parts of Europe. Very many species have been imported in great quantities, and a number of them have been established in New England territory. The effect of their work is being more strongly seen each year, and it is hoped that they will shortly become so numerous as to be important factors in holding the destructive insects in check.

Recent discoveries have been made which promise, by observing certain principles in forest management, to result in the preservation of good stands of timber in the New England forests in spite of the continued presence of these tree pests.

OTHER NOXIOUS INSECTS.

The introduction of the parasites and natural enemies of the gipsy moth and brown-tail moth is not the only work of this kind done by the bureau. An important enemy of the black scale of the orange and olive has been introduced, an egg parasite of the elm-leaf beetle as well, and at present the bureau is engaged in importing the European parasites of the alfalfa weevil. Similar shipments of American parasites to foreign Governments have also been made, and the most striking success has been achieved in the sending of a minute parasite of the mulberry scale from the United States to Italy, where it is reported to have been of the greatest benefit in the destruction of the scales, which bred so numerously in the mulberry plantations as to threaten the entire destruction of this tree upon which is based the great silk-growing industry of that country.

A few years ago a thrips appeared upon pear trees and other deciduous fruit trees in central California, completely blasting the crops and spreading rapidly, threatening the destruction of practically all deciduous fruits on the Pacific coast. After two years' investigation of the method of life of this pest, the bureau discovered perfectly competent remedies, by the use of which orchardists are once more growing their normal crops.

Three years ago a weevil destructive to the alfalfa was discovered in the vicinity of Salt Lake City. It has spread rather rapidly

to the north and to the east, and appeared to threaten great danger to this vitally important crop of the irrigated regions of the West. The bureau's experts have been studying it since the beginning, have been engaged in importing its natural enemies from Europe (it is a European insect), and have now discovered a method by which the pest can be handled after the first crop of alfalfa has been harvested. It is hoped that in time some other means will be discovered whereby the important first crop can be saved.

INSECTS AS CARRIERS OF DISEASES.

Throughout the entire 16 years the important subject of the carriage of diseases of man and animals by insects has been investigated. The mosquitoes that carry malaria and yellow fever have been carefully studied, and publications have been issued warning people and giving remedies.

In the same way the relation of the common house fly to the carriage of typhoid fever and other intestinal diseases has been studied, and in the same way publications of warning have been issued, and these have given remedies.

The tick which carries the Rocky Mountain spotted fever has also been studied, and an investigation has been completed which points out a way to control this dangerous creature.

The ticks that carry the Texas fever of cattle have also been made the subject of intensive study, and many facts have been ascertained which are of service to the Bureau of Animal Industry in its large-scale work in pushing the quarantine line against southern cattle farther and farther to the south.

FUMIGATING CITRUS TREES.

The process of fumigating citrus trees with hydrocyanic-acid gas, which was carried on at a very great expense by the prosperous owners of citrus groves in southern California a few years ago, has been studied with the utmost care, and as a result the expense of the process has been reduced to a remarkable degree. A single grower has stated that the result of this work has saved him a quarter of a million dollars.

INSECTS INJURIOUS TO TREES.

Facts determined within the past 10 years indicate quite conclusively that 7 species of bark beetles of the genus Dendroctonus, injurious to coniferous trees, have killed more merchantable pine, spruce, and Douglas fir timber in this country than has been killed in the same period by forest fires. Investigations by the bureau have resulted in the gaining of a very complete knowledge of these injurious species and in ascertaining methods of control. The success of

these methods of control has been demonstrated many times. Extensive depredations in Colorado, South Dakota, Montana, Oregon, and California by one of these beetles have been successfully controlled in localities where cooperative demonstration work has been carried on at a cost conforming to profitable business methods.

In 1910 and 1911 an outbreak of the southern pine beetle, which 20 years before had devastated the pine forests of West Virginia and Virginia, threatened a like fate to the pine timber of the South Atlantic and Gulf States, but practical demonstrations by representatives of the bureau and the adoption by the owners of the timber of the methods recommended resulted in the cutting of millions of cords of wood from the infested trees, which was burned for fuel, thus destroying the broods of the beetles in the bark. This has contributed to the almost complete control of the beetle and to the saving of one of the principal natural resources of the South.

The officials of Federal, State, municipal, and private reservations, as well as private owners of forest and wood lots, are beginning to avail themselves of this information, so that, as a direct result of the investigations of the department, these beetles will be eliminated as an important factor in forest destruction.

DEMONSTRATION WORK.

Demonstration work, such as is mentioned in the previous paragraph, has come to be an important function of the bureau, and such work has been carried on against the codling moth in different parts of the country, against the pear thrips in California, against the grape rootworm in Pennsylvania, against the cotton boll weevil in Texas, against the cattle tick in Texas, against the plum curculio in Georgia, and against other insects in other parts of the country. There seems to be a great difference between the results of telling people how to do things and showing them how to do them.

COOPERATION WITH OTHER AGENCIES.

In the course of the work there has been much cooperation with State experiment stations and with other organizations. For example, the bureau has cooperated with Massachusetts in the work on the gipsy moth parasites, in the general moth work, and in the inspection work; with Montana on the spotted fever, with Louisiana on the Argentine ant, with Texas on cotton insects other than the boll weevil, with California on the subject of scale parasites, with Tennessee on tobacco insects, with South Carolina on the red spider and other cotton insects, with Indiana and Kansas on forage-crop insects, with Utah on the alfalfa weevil, with Hawaii on the Mediterranean fruit-fly, with Wisconsin on cranberry insects, and with many others.

LIFE HISTORIES OF INSECTS.

During the 16 years the complete life histories of many hundreds of species of injurious insects have been worked out, and the publications of the service during that period cover in competent form practically all of the principal crop pests of the United States.

SOIL INVESTIGATIONS.

FEARS OF SOIL EXHAUSTION.

For the fiscal year 1897 there was appropriated for the Division of Soils $15,300, while for the year 1912 the appropriation for the Bureau of Soils was $262,060. In the former period the work was 3 years old, and the foundation for subsequent development was still being laid.

For 60 years the scientists of the world had wrestled with Liebig's mineral theory of plant food without progressing much beyond the limits of his classical work. No practical or efficient basis of classification of soils had been worked out, the adaptation of crops to soils was not appreciated, there was no rational theory of fertilization, no specific knowledge of how fertilizers act upon the soil or plant, and no efficient methods of determining the manurial requirements of a soil.

Moreover, our people have always been an adventurous people; the country sparsely settled and new in experience and tradition. Methods of culture and crop rotation adapted to the different soils were little understood or considered of minor importance. The impression was general that the soils of the country were wearing out with ever-decreasing productivity, and alarm was felt for the future of our increasing population and the possibility of the ultimate exhaustion of our soils and of the natural deposits of fertilizer materials, which it was claimed were essential for the maintenance of the proper mineral composition of agricultural lands.

These are subjects that are at the very foundation of the Nation's prosperity, and are matters that I have had deeply at heart during my term of service.

THE SOIL AN INDESTRUCTIBLE ASSET.

As a result of the profound investigation in the Bureau of Soils of reported cases of soil exhaustion, it appears that all such cases are due principally to mismanagement of tillage operations, to the lack of proper adaptation of soils and crops, to the unwise rotation of crops, and to the misuse of fertilizers and manures, making it a personal failure rather than a natural and fundamental deterioration of the soil. It can be said, therefore, that the soil is the one inde-

structible asset of the Nation, which can be vastly improved by better and intensive methods or which can be temporarily impaired by wrong usage.

This conclusion was reached through a mineralogical study of soils and rocks, the study of the solubility of soil minerals and of the composition of the soil solution, the study of the profound changes taking place in the soil constantly through the mixing of soil grains by erosion, winds, and internal movements, and in the soil constituents through the action of percolating and capillary waters, the study of the increasing yield of farm crops during the 40 years for which records have been kept in this country, a study of the much larger increases in yields on the older soils of Europe during the past 300 years, and by a comparison of the chemical composition of the relatively new soils of this country and the relatively older agricultural soils of Europe.

SOIL SURVEYS.

Admitting that the productivity of our many important soils depends in the long run upon the knowledge and skill of our people in handling each type according to its specific needs, the importance and significance of the bureau's work in the classification and mapping of soils can be more fully appreciated.

During the last 12 years soil surveys have been made of 622,595 square miles, or an area practically as large as the combined areas of Germany, France, Great Britain, Ireland, and Italy. In this work the soils are classified according to their origin and constitution, and the reports discuss their characteristics, their principal tillage requirements, and their crop adaptations. Omitting the sparsely settled Rocky Mountain region, the Northwest Intermountain region, the arid Southwest, and the Great Basin, the survey has covered 29.2 per cent of the land surface of the United States, giving a complete classification of the soils, showing their area and distribution within the limits of the surveys, and indicating in a general way the localities outside of the areas surveyed where the different soil types may be expected to be found.

ADAPTATION OF SOILS.

During the progress of this work and through supplemental investigations, the special adaptation of many of these types of soils to crops has been worked out, and we have definitely established the cause of many failures in farming to be the attempt to produce crops on soils to which they are not adapted and upon which a high degree of commercial success can not be expected.

Conversely, we have a knowledge of soils that are peculiarly adapted to certain crops and others which should be used for certain crops when increasing density of population and market and transportation facilities justify their most intensive use.

Examples of such knowledge acquired through the soil survey might be multiplied indefinitely. As a result of the soil survey of the Connecticut Valley in 1899, possibilities of introducing the Sumatra type of tobacco wrapper leaf were pointed out on certain soils of that locality, and since then an industry has been established where a very fine textured leaf is produced, under the most intensive cultivation, which sells for as much as $2 a pound, as against 20 to 30 cents a pound for the leaf previously grown, and the industry has now become one of considerable magnitude and importance.

In the soil of the Nacogdoches area, Texas, the similarity of certain soils there with the soils of the Vuelta Abajo district of Cuba was noticed, and as a result of field experiments put out by the bureau it was found that the Cuban tobacco seed produced on certain types of soils the fine aroma of the leaf grown in Cuba.

MALADAPTATION.

The soil survey has shown that not over 5 per cent of the soils adapted to winter and spring vegetables are now being devoted to these valuable crops, the remaining 95 per cent being little used, as they have little value for general farm crops and are not needed at present for the crops for which they are adapted.

In the development of this industry in the future there will be no excuse for the mistakes that have been made in the past, as the relation of every type of truck soil to the variety of truck crop to which it is best adapted is now well understood, and the location of these soil types is known.

Similarly, the vast opportunities for the safe development of fruit and of dairy industries so far as they are dependent upon the soil and climatic conditions and cultural treatment are now assured, if one but takes advantage of the work that has been done by the Department of Agriculture.

The much-dreaded injury from alkali in the soils of the dry regions of the West no longer need exist, as the Bureau of Soils has located and accurately mapped the alkali soils, so far as they have been encountered in the survey, has studied the type of alkali in each district, and has shown that it can be controlled and eliminated from serious consideration by practicable methods of soil management.

Through laboratory research it has been found that not only do soil types differ in their relation to crops but that they differ also in

the effect left by these crops which influences succeeding crops, and that for the highest development of the soil crops must succeed crops in a certain general order, which order of rotation is dependent upon the nature of the soil as well as upon climatic conditions and cultural treatment.

COMMERCIAL FERTILIZERS.

The subject of the use of commercial fertilizers, which has developed to so large proportions in the last 50 years, has also been investigated by the bureau, and it has been found that they have very important functions in addition to their value as mineral plant foods.

The soil is not static, as was formerly supposed, but is dynamic, with many functions continually at work producing changes and always mutually affecting one another, and these changes can also be profoundly influenced by the substances ordinarily used as soil amendments.

It has further been shown that the United States has within its borders ample supplies of the raw materials which experience has proved to be most useful as fertilizers to supply the Nation's needs for an indefinite period into the future.

There is in this country enough high-grade phosphate rock to supply three times the present demands for 12 centuries or more. The giant kelps of the Pacific coast and Alaska, if properly conserved and cropped on scientific principles, can probably surpass in yield of potash salts the famous Stassfurt mines, and there is reason to expect that commercial production of potash from feldspar will soon be a reality. With many sources of nitrogen carriers yet to be utilized to their fullest extent and with practicable methods of "fixing" atmospheric nitrogen already finding a home in this country, the future may be faced with equanimity so far as problems of supply are concerned.

All of the results of fertilizer experiments that have been made and published in this country have been summarized in a series of bulletins, which, together with the laboratory investigations now going on, will ultimately, it is believed, lay the foundation for a rational system of fertilization.

FUTURE PRODUCTIVITY.

With intelligence and care in the cultivation of the lands already under agricultural occupation and in the taking up of idle lands with increasing density of population, it is estimated that the soils of this country will be in about the same state of development as the soils of France and Germany, and that they will produce many times as much as they do to-day.

ANIMAL INDUSTRY.

MANY NEW LINES OF WORK.

The work relating to the live-stock industry, which includes not only fostering the interests of those engaged in production but helping the consumers of the country to obtain a supply of wholesome animal food, such as meat, milk, and eggs, has been greatly enlarged during the 16 years under review. Prior to 1897 the work of the Bureau of Animal Industry related almost entirely to diseases of animals, meat inspection, etc., and very scant attention was given to such important things as animal husbandry and dairying.

ANIMAL HUSBANDRY.

BEGINNINGS.

Animal husbandry as a separate branch of the Bureau of Animal Industry at Washington was first recognized on July 1, 1901, when an expert in animal husbandry was appointed. In 1904 a specific appropriation for such work was requested, and Congress appropriated $25,000 for cooperative experiments in animal feeding and breeding, to be spent during the fiscal year 1905. The animal husbandry work began to be informally designated the "Animal Husbandry Office" about this time, and was formally designated the "Animal Husbandry Division" by the Secretary's order on January 1, 1910.

HORSE BREEDING.

The Animal Husbandry Division started the revival of interest in the breeding of Morgan horses. In cooperation with the Colorado Experiment Station the division is demonstrating that the utility characteristics of the American trotter, to which frequent attention has been called by show-ring performances, can be perpetuated by proper selection.

It has brought about a complete reversal in the procedure of importing animals into the United States for breeding purposes, and now a man in the horse-importing business must not only import a pedigree certificate, but a horse as well whose description agrees with that outlined in the certificate.

INFERTILE EGGS.

It has shown that by producing infertile eggs the keeping quality of eggs can be greatly improved and millions of dollars in losses from bad eggs can be saved. At its instigation and with the cordial cooperation of local authorities, the egg trade of Kansas was placed on a quality basis in a single year. Other States have followed the example set in Kansas.

BEEF PRODUCTION IN THE SOUTH.

In cooperation with the Alabama Experiment Station it is being demonstrated that beef can be produced cheaply in the South. The results of eight years' investigation show that the South, east of the Mississippi River, is the territory to which the people of the United States must look in future for reasonably cheap beef.

SHEEP.

In Wyoming sheep husbandry is being studied to determine the most profitable types and lines of breeding on the range. In Vermont a Southdown flock of high quality is kept.

ANIMAL NUTRITION.

In cooperation with the Pennsylvania State College the most complete apparatus in the world has been built for the study of the nutrition of domestic animals. The beginning of this work antedates by three years the inauguration of animal husbandry work at Washington.

MILITARY HORSES.

In the current appropriations act, for the first time in the history of the United States, Congress has recognized the fact that to insure a sufficient supply of suitable horses for military purposes Government aid is necessary. The Government proposes to furnish the stallions but the farmers will breed the remounts. Work will begin without delay, and American farmers will therefore have a share in the national defense.

WORK RELATING TO THE DAIRY INDUSTRY.

The Dairy Division of the Bureau of Animal Industry was organized July 1, 1895, with four employees, and up to 1897 its work consisted of compiling and publishing data relative to conditions of the dairy industry and the methods most approved at that time. All the experimental and extension work has been done since March, 1897.

EXPORT BUTTER.

In 1897 experimental shipments of butter to foreign markets were begun. For several years the development of foreign markets for dairy products in Europe, West Indies, and Asia constituted a large part of the division's activity.

INCREASING THE PRODUCTION OF MILK AND BUTTER FAT.

Census figures show that the average production of milk and butter fat per cow in the United States is entirely too low. A large

proportion of the cows do not produce enough to pay for their feed at market prices. By better selection of cows and better methods of feeding it is possible to increase considerably the average production, which would mean not only the placing of dairy farming on a profitable basis but a more plentiful supply of an important class of food products. Work in this direction has been carried on for several years, and the results are becoming apparent.

DAIRYING IN THE SOUTH AND FAR WEST.

Field work for the development and improvement of dairy farming was begun in 1905 with a survey of conditions in the South. That section then had scarcely any dairying, but stood in urgent need of its beneficial effects. Cooperative relations were entered into with State authorities and field work has been carried on in Alabama, Mississippi, Tennessee, North Carolina, South Carolina, Georgia, Kentucky, Maryland, Virginia, Louisiana, and Texas. The people and authorities of the States have become very much interested and are now bearing a large part of the expenses of the work. Dairying has now come to be of considerable importance. Wherever one farmer has been induced to adopt improved equipment and methods the influence of his example has spread in all the surrounding community.

In 1910 similar work was taken up in the Far West in regions where dairying is an entirely new business—beef cattle, sheep, and wheat growing having hitherto received the chief consideration. Field men are at work in Colorado, Idaho, North Dakota, and Utah.

COW-TESTING ASSOCIATIONS.

Cow-testing associations, or cooperative clubs for recording the feed and production of the individual cows, are an important means of bringing about increased production of milk and butter fat, and for the past five years work has been carried on for the promotion of these associations. The associations organized number 118, of which 97 are active, with 39,000 cows tested yearly. The records of a Michigan association show that in four years there has been a marked increase in the average production of milk and butter fat per cow, while the average annual profit has been practically doubled.

Another promising line of work just started is the organization of bull associations, or clubs for the cooperative purchase and use of carefully selected purebred bulls, with a view to improving the breeding of dairy herds.

Much investigational work has been conducted with barns, silos, and feeds. The introduction of the popular concrete silo is largely the work of the Dairy Division.

MARKET MILK.

Work for the improvement of market milk was undertaken in 1905. Attention at first was given only to the sanitary aspects of dairy-farm conditions. Later the product was followed all the way to the city, even into the consumer's ice box, and attention is now being given also to the economics of the subject. A great factor in milk improvement has been the introduction of the score-card system of inspection. Under this system dairy farms, city milk plants, grocery stores, and even the milk and cream are graded according to a numerical valuation of the various elements involved, the total of the score card giving a good comparative idea of the place or thing scored. At the present time over 170 cities are using a score card for inspection, and the milk supply of 22,000,000 people is thereby safeguarded. The efficiency of official inspection has been greatly enhanced, infant mortality has been reduced, and adult health has been bettered. The score card has been translated into French for use in Canada.

This work for the improvement of the milk supply is done largely in cooperation with State dairy commissioners and State and city boards of health. These agencies look to the department for leadership, expert advice, and up-to-date information.

Beginning in 1908 competitive exhibitions of milk and cream have been held under the auspices of the Dairy Division in various cities. Samples are exhibited and scored, and lectures and addresses are given. These exhibitions have educated both dairymen and consumers.

CREAMERIES AND CHEESE FACTORIES.

Manufacturing enterprises such as creameries and cheese factories are an important part of the dairy industry and have received special attention during the past six years. This work consists of investigations, demonstrations, and cooperative work in the organization and management of creameries and cheese factories, including market conditions and methods, sanitary condition of creameries, and quality of cream; investigations in the manufacture of ice cream, condensed milk, and desiccated milk; and the inspection of renovated-butter factories and materials.

Demonstration work in creamery management is done under the supervision of expert creamery operators, who take temporary charge of creameries and show how to organize properly the routine work and apply improved methods of management. It is expected that this work will result in showing the necessity for more efficient creamery management, also in an improvement in the quantity and quality of butter made. The loss from lack of these things is now estimated at from seven to eight million dollars a year.

STORED BUTTER.

Great improvement in the quality of stored butter has been made possible by investigations in the manufacture and storage of sweet-cream butter. Butter made from pasteurized sweet cream without the use of a starter, and sealed in tin cans, will keep from 8 to 10 months in storage with but very little deterioration in quality and with practically no development of objectionable flavors, while butter made in the old way from sour, unpasteurized cream is of inferior quality and shows considerable deterioration after storage. These conclusions are based on the results obtained in the manufacture of over 2,000,000 pounds of butter during the last three years.

QUALITY OF CREAM.

Investigation of the quality of cream used in making creamery butter and the sanitary condition of creameries is expected to reveal the true cause of the poor quality of much of the butter now being made. This work is done by men who are practical creamery operators. They visit the creameries and carefully examine the sanitary conditions. They determine the temperature, acid content, age, and grade of cream and the methods used in its production and care before delivery to the creamery. It has been estimated that less than 10 per cent of the butter made is of first quality, and it seems probable that when the cause is known a remedy may be suggested.

RENOVATED-BUTTER INSPECTION.

A great deal of butter after becoming rancid is sent to factories to be "renovated" or made fit for food and again placed on the market. Under a law passed in 1902 an inspection of these plants and of their materials and products is maintained. This work has resulted in improving the sanitary condition of the plants making renovated butter, a more careful selection of the materials used, and the proper marking of packages to show that the product is "renovated" or "process" butter, and thus prevents deception of the purchaser. This butter when made under good sanitary conditions and from proper stock is wholesome, though not equal in quality to high-grade creamery butter. When sold on its own merits, its sale is perfectly legitimate.

LABORATORY WORK ON DAIRY PROBLEMS.

Since 1902 laboratory work on dairy problems has been carried on, and at the present time there are 25 people in the Dairy Division laboratories engaged in research work covering nearly all branches of the dairy industry.

The most notable results so far obtained from the laboratory work are, briefly: The determination of the influence of the breed, the individuality of the animal, and the period of lactation on the composition of the milk; a study of the bacteria surviving pasteurization, and the discovery that certain types of lactic acid bacteria are sufficiently resistant to heat to withstand the temperature of pasteurization, showing that properly pasteurized milk will sour normally; the exact determination of the changes produced in milk by the heat of pasteurization, showing that certain objections to pasteurization are unfounded; the determination of the bacteria and fungi concerned in the ripening of Camembert cheese, and the establishment of methods of making this type of cheese in this country; the discovery that certain types of bacteria hitherto unobserved in Cheddar cheese attain large numbers during the ripening period, and are probably concerned in the production of the flavors; the development of a method whereby cheese of a uniform quality can be made from pasteurized milk; the establishment of the fact that the ordinary off flavors of butter are caused, not by microorganisms, but by spontaneous chemical changes, some of which are induced or accelerated by the acidity of the cream and the presence of iron or copper salts, and in which oxygen inclosed in the butter takes a part. As a result of this latter work it has been demonstrated that butter can be made which will retain its sweet flavor in storage for many months.

Among the new pieces of apparatus developed in the laboratory are one of the first tests for moisture in butter, an improved type of lactometer, a simple butter color standard, a method and apparatus for determining fat in butter, and a humidistat.

MEAT INSPECTION.

In 1897 the Government meat inspection was carried on under the law of 1891, which provided only for the inspection of animals before and at the time of slaughter and gave no authority to control sanitation, to supervise the various processes of curing, canning, and preparing meats, or to prevent adulteration or the use of harmful preservatives. The funds available for the inspection were insufficient for carrying on even the ante-mortem and post-mortem inspection at all establishments doing interstate business.

The new law, which was passed in 1906, remedied these defects and increased the powers of the inspectors, and made a permanent annual appropriation of $3,000,000, so that it may now be truly said that all the different processes in the preparation of meats and meat food products from the "hoof to the can" are carefully supervised by the department and that this inspection and the sanitary condition of the establishments are maintained at a higher standard than that of any other nation.

STATISTICS OF OPERATIONS.

The number of animals which received Federal inspection at the time of slaughter increased from 26,500,000 in 1897 to over 59,000,000 in 1912. The number of carcasses condemned increased during the same period from 67,000 to over 203,000 and the number of parts of carcasses condemned at slaughter increased from 39,000 to 464,000. In 1907 the inspection was conducted at 128 establishments in 33 cities and towns and in 1912 it covered 847 establishments in 238 cities and towns.

The following data show some of the operations of the Federal meat inspection for the last six years during which the new law has been in effect:

Animals inspected at slaughter, over	321,000,000
Carcasses condemned, over	900,000
Parts of carcasses condemned, over	4,500,000
Meat and meat food products:	
Pounds reinspected in their various preparations, over	37,000,000,000
Pounds condemned on reinspection, over	140,000,000
Pounds exported under certificates, over	7,000,000,000
Veterinary inspectors and assistants, over	2,400

In addition to the 847 establishments where Federal inspection is continuously maintained, the establishments of more than 2,000 retail butchers and dealers, who hold certificates of exemption that they may make interstate shipments of meats to their customers, are inspected as to sanitary conditions and the wholesomeness of the products they handle.

The high character of the Federal meat inspection has had the effect of greatly stimulating sentiment for the establishment of abattoirs under State or municipal control and for establishing an efficient State or municipal inspection of meats intended for purely local consumption.

INSPECTION AND QUARANTINE OF IMPORTED ANIMALS.

For many years the department has maintained a system of inspection and quarantine of imported animals for the purpose of protecting the live stock of this country against contagious diseases which prevail in other parts of the world, and which would do tremendous damage if they should gain entrance in this country. In 1897 there were three animal quarantine stations on the Atlantic seaboard, all of which were but poorly equipped and on rented land located near the ports of Boston, New York, and Baltimore.

At present the department has three well-equipped animal quarantine stations for these ports, the land as well as equipment in each case being owned by the Government. Excellent accommodations are provided for animals subject to quarantine.

The present regulations require, in brief, that all horses, cattle, sheep, and other ruminants and swine must be inspected before they are admitted, and, in addition, that all ruminants and swine from any part of the world except North America shall be quarantined. Nearly all the animals admitted on inspection without quarantine come from Canada and Mexico, and consist mainly of cattle and sheep for feeding and slaughter and horses, mules, etc., for work purposes, although some animals from Canada are imported for dairy and breeding purposes. Nearly all the live stock brought from across the seas are pure-bred animals for breeding purposes. During the past five years about a million and a quarter animals have been imported under this system of inspection and quarantine.

EXCLUSION OF DISEASES.

Owing to the existence of communicable diseases of animals among the live stock of various parts of the world, importations from over seas have been mainly restricted to Great Britain, Ireland, and the Channel Islands. It is required that a permit be procured from the Secretary of Agriculture prior to the shipment from countries other than North America of cattle, sheep, and other ruminants and swine for their landing subject to inspection and for their detention in quarantine at one of the Federal stations.

During this period of 16 years surra reached our shores in an importation of Brahman cattle from India, but was promptly stamped out in quarantine. Also Malta fever was discovered in a herd of goats from the island of Malta and was likewise eradicated by the slaughter of the affected animals before there was any opportunity for the disease to extend to other animals.

Foot-and-mouth disease has during the above period twice appeared in this country, but has in each instance been promptly eradicated. The infection was introduced in contaminated vaccine imported by manufacturers of biological products, and in neither case was the disease introduced through the medium of products over which this department maintains supervision.

INSPECTION OF LIVE STOCK FOR EXPORT.

Animals intended for export are given a veterinary inspection by the Bureau of Animal Industry in order to guard against the exportation of any that may be affected with disease and to conform to the requirements of certain foreign Governments. This inspection thus serves to maintain a good reputation for American live stock in foreign markets and to keep open markets that would otherwise be closed against us.

Our largest exports of cattle are to Great Britain. Considerable numbers of cattle, sheep, horses, and mules are also inspected for export to Canada, and when required by the Canadian regulations the cattle are tested with tuberculin for the detection of tuberculosis, and equine animals with mallein for the detection of glanders.

During the past five years the bureau has made over two and a half million inspections of animals for export. This number includes duplicate inspections of many animals inspected first at interior points, such as Chicago and Buffalo, and again at the ports of export, such as New York and Boston. The actual number of animals inspected was over a million and three-quarters. In this number there were nearly 300,000 Canadian animals shipped through the United States in transit to other countries, mainly Great Britain. The tuberculin test was applied to over 2,200 cattle and the mallein test to about 34,000 horses and mules.

Our exports of meat animals have decreased in recent years because of the heavy demand and high prices of the home market. The United States exports comparatively few live animals to Continental Europe, mainly because our stock is excluded by the policy of some of the European Governments.

OCEAN VESSELS.

Besides inspecting live stock for export, the bureau inspects the ocean vessels that carry such animals, and enforces regulations as to fittings, feed, water, attendants, etc., so as to insure that the animals will be carried in a safe and humane manner and reach the other side in good condition. In the five years mentioned 2,733 inspections of vessels were thus made.

On arrival at the principal British ports the animals are again inspected by the representatives of the Bureau of Animal Industry stationed there, as well as by the British authorities. Statistics show that the losses of live stock in ocean transit, which were formerly quite heavy, have been reduced to a negligible point under the bureau's supervision, and insurance rates have been correspondingly decreased.

STAMPING OUT DISEASES OF ANIMALS.

In suppressing and eradicating infectious diseases of live stock the Bureau of Animal Industry has been especially successful, and this work has saved the country from losses and damage that would otherwise have run into untold millions of dollars. To appreciate the effective work in our own country we must compare conditions here with those in other parts of the world where destructive animal diseases play havoc with the live stock. Even Europe, with its well-organized and efficient government forces, is overrun with foot-and-

mouth disease and other infectious diseases, and in spite of a continual struggle at great expense and with heavy losses the diseases persist. Fortunately in the United States we have kept out some of the worst diseases, and when foot-and-mouth disease and pleuropneumonia have gained entrance they have been stamped out by vigorous work before the infection had spread to such an extent as to place us in the unfortunate position of some of the European countries.

FOOT-AND-MOUTH DISEASE.

Since 1897 the bureau has twice been called upon to deal with outbreaks of foot-and-mouth disease of foreign origin, first in Massachusetts and adjoining States in 1902–3, and then in New York, Pennsylvania, Maryland, and Minnesota in 1908. Fortunately, the bureau was already equipped with a capable staff and organization, and each time the disease was promptly eradicated after a few months of vigorous effort, with the cooperation of State authorities.

The means used were strict quarantine, careful inspection, the slaughter of all diseased and exposed animals, and the disinfection of premises. Had it been necessary to lose time in getting together an organized force, and had the force been less capable, the infection would in all probability have extended to the great cattle-raising regions of the West, where it would have caused tremendous damage and where its eradication would have been much more difficult if not impossible.

The energy and promptness with which the second of these outbreaks was stamped out led an intelligent old farmer who had observed some of the work to express his commendation of the department's efficiency. He said that ours is a great Government, as shown by the fact that when a strange malady of an intensely infectious nature, capable of inflicting widespread and serious loss to live-stock owners, struck many herds over a wide area of territory, there appeared at once with the energy and promptness of a city fire department a Government force of veterinarians trained to cope with the disease, whose vigorous measures suppressed it completely almost before the people of the community had time to realize the gravity of the situation. And he remarked again that it was indeed a wonderful Government which was prepared to meet so unusual an emergency and to meet it in such manner.

TEXAS FEVER.

The department has also undertaken to rid the United States of certain diseases which have long existed here and which have been a heavy handicap to the stock-raising interests. All this work has been begun and carried on within the past 16 years, and the prog-

ress and results so far attained have more than justified the expense. The three diseases against which our administrative efforts have been chiefly directed are Texas fever of cattle, sheep scab, and cattle mange.

The boundary of the area infected with Texas fever was located by the department between the years 1882 and 1885, and since that time a quarantine has been maintained, and there have been restrictions on the movement of cattle from the quarantined area so as to prevent the spread of the disease. The discovery that the tick is the carrier and disseminator of Texas fever was made by scientists of the Bureau of Animal Industry in 1890, and the eradication of the tick has long been believed to be possible. No systematic effort, however, to eradicate these ticks was undertaken until 1906. In that year Congress made an appropriation for this purpose, and the work was begun in cooperation with authorities of the affected States.

When it was first proposed to undertake the extermination of the Texas-fever ticks this was regarded by many as an impossible task, but it was soon proven to be not only possible but practicable. Since the work was begun in 1906 about 165,000 square miles have been freed of the ticks and released from quarantine. This is equal to more than the combined areas of Georgia, Alabama, and Mississippi, and is nearly one-fourth of the total area infected at the time of beginning the work.

The objects of eradicating the ticks and thereby stamping out the disease are to give the cattle owners of the quarantined area an unrestricted market for their cattle, thereby enabling them to obtain better prices; to prevent the losses due to the tick as a transmitter of disease and also as a simple parasite; to increase the number and improve the quality of cattle in the South; to increase the fertility of the soil by promoting cattle raising, and to improve agricultural conditions generally. The losses due to the cattle tick are conservatively estimated at from $60,000,000 to $100,000,000 a year.

The eradication of cattle ticks is an important step in the agricultural regeneration of the South. The presence of this parasite has been a great handicap to cattle raising there, but with the tick out of the way the fine natural advantages of that section for cattle raising will enable the southern farmers to build up a profitable industry and add greatly to the country's beef supply, which is now running short. The eradication of the tick is also important for the development of the dairy industry.

SHEEP SCAB.

In 1899, owing to complaints from England that American sheep shipped to that country were frequently found to be infected with

scabies, the department issued the first order relating to interstate shipments of sheep affected with that disease. Federal inspectors were placed at the principal feeding points of all the railroads leading to market centers with instructions to inspect all shipments of sheep, and if any were found affected with scabies to supervise their dipping and treatment or allow them to proceed to a point where they could be dipped under Federal supervision. Later on this inspection of sheep was extended to the points at which the sheep originated and were accepted for interstate movement.

While this plan reduced the trouble and was more satisfactory to the sheep growers and transportation companies than the stock-yards inspection, still it did not eradicate the disease on the range to the extent that was hoped for. Accordingly, in 1904 a Federal quarantine was placed on all the territory west of the eastern border of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas, which included an area of 1,853,811 square miles. A plan of cooperation was arranged by the Department of Agriculture with the sheep sanitary commissions of several States providing for the inspection of all sheep and the proper treating of all flocks of sheep found to be affected with or exposed to disease. This plan was found to be very effectual and was taken up by other States as soon as State laws could be obtained under which the department could cooperate.

As a result of work under this plan a large area was in 1907 released from Federal quarantine on account of the nonexistence of disease, and from that time until the present there has been released an area comprising 1,171,590 square miles. This leaves only 682,221 square miles still in quarantine, and in this area sheep scabies exists to a very slight extent. As illustrative of this point it may be stated that when the eradication work was first taken up in New Mexico, in the spring of 1907, 48 per cent of the 4,500,000 sheep in that State were diseased. As a result of State and Federal cooperation and the annual dipping under Federal supervision of all sheep within the State, the inspection of sheep in the spring of 1912 showed the existence of less than 1 per cent of disease.

Contrary to predictions made by many woolgrowers, sheep scabies has within the last 10 years been practically eliminated from the United States, and as a result the sheep industry is in a very much more prosperous condition than when a heavy loss in the product of wool and mutton was each year experienced as the result of sheep scabies.

CATTLE MANGE.

In 1904 it became evident to the department that cattle scabies or mange existed quite extensively in the United States, especially in the territory west of the Missouri River and east of the Rocky Mountains. Accordingly, regulations tending toward the control and

eradication of the disease were promulgated, and the areas where cattle scabies was known to exist to the greatest extent were placed under Federal quarantine. This included an area covering about 452,632 square miles in several Western States.

As in the work of eradicating sheep scabies, Federal and State cooperation was resorted to, with the result that since 1907 cattle scabies has been successfully controlled and 218,572 square miles of territory released from quarantine.

While the area released from quarantine seems to show that the work is only half accomplished, this does not express the real progress made. As the extent to which disease exists in the territory still remaining in quarantine has been so greatly reduced, it will only be a short time until cattle scabies in the United States will be a matter of history.

BOVINE TUBERCULOSIS.

In 1907 the Bureau of Animal Industry first undertook to cooperate actively with individual herd owners and State and city officials in the eradication of bovine tuberculosis from dairy herds. In the first year 658 cattle were tested, of which 118, or 17.9 per cent, gave reactions indicating the presence of tuberculosis. These tests were applied only to cattle whose owners signed an agreement with the bureau providing for the slaughter or efficient quarantine of reactors, the tuberculin testing of animals added to the herd, the disinfection of infected premises, and the observation of proper sanitary measures. This work has grown in popularity until in 1912 cattle tested numbered 8,433, of which 769 were reactors or suspects. The percentage of tuberculosis now being found by annual retests in this territory has thus been reduced to 2.30 per cent. During the period covered 25,193 cattle have been tested.

In the fall of 1909 special cooperation in the eradication of bovine tuberculosis was given in the District of Columbia. In the first complete testing of the District cattle a total of 1,701 cattle were tested, of which 321, or 18.87 per cent, were tuberculous. A systematic retesting has reduced the percentage to 1.29, and in the meantime the testing of cattle entering from other States has prevented the introduction of diseased animals.

This cooperative work has been extended into various States which desired the assistance of the bureau in dealing with the bovine tuberculosis problem. The tuberculin test is also applied to cattle for breeding or dairy purposes for interstate shipment.

The effects of this work are well illustrated by the marked reduction in the prevalence of tuberculosis in the herds of cattle which are being maintained under bureau supervision. These results have been so satisfactory to the cattle owners that requests for cooperation

far in excess of what can be done with the present force are constantly being received from the individual owners, as well as from city and State officials.

SCIENTIFIC INVESTIGATIONS OF ANIMAL DISEASES.

Scientific knowledge of the causes and nature of animal diseases and their relation to human health is a necessary basis for administrative work in dealing effectively with such diseases. In the domain of scientific research the Bureau of Animal Industry has had a large share in the advancement of knowledge. The investigations of this kind have been carried on by the Pathological, Biochemic, and Zoological Divisions, and the Experiment Station.

THE CATTLE TICK.

Although some excellent results were obtained prior to 1897, the energies of the scientific staff were centered upon the study of only a few diseases. The country had but recently been freed from infectious pleuropneumonia of cattle, and as Texas fever was apparently the most serious animal disease existing at that time, much attention was devoted to the study of its cause and prevention. The later work relating to this disease has included the determination of the shortest and longest periods of time in the development, at all stages, in the life history of the Southern cattle tick, the carrier of Texas fever of cattle; the determination that apparently healthy southern cattle may continue to carry the parasite that causes Texas fever in their blood for years after they have been removed from the so-called infected territory and have been protected against all sources of infection, and the determination that noninfectious cattle ticks become infectious and capable of causing Texas fever by living a single generation on the bodies of southern cattle that have been kept half a dozen years or longer in apparently perfect health north of the Texas fever territory, and away from all sources of infection. These results form a series of contributions of the greatest importance in the practical work of the eradication of southern cattle ticks and the prevention of Texas fever.

The efficacy of arsenical dips as remedies for destroying cattle ticks and the proper strengths of the dipping solutions have been proved and determined by careful and prolonged investigations. Without an efficacious remedy like the arsenical dip, progress in tick eradication would be extremely difficult if not practically impossible.

BLACKLEG VACCINE.

The extensive losses of young cattle from blackleg, together with the perfection of a protective vaccine by Kitt and other European investigators, led to the inauguration in 1897 of the manufacture and

distribution of blackleg vaccine by the department. In the past 15 years more than 17,000,000 doses of this vaccine have been distributed to stock raisers. In regions where blackleg prevailed the losses formerly amounted to more than 10 per cent of the annual calf crop, but by the use of the vaccine the losses have been reduced to less than 0.5 per cent of vaccinated cattle.

TUBERCLE BACILLI.

The rapid increase of cases of tuberculosis among the animals slaughtered in the various packing houses of the country demanded the careful study of the many questions which were connected with this insidious disease. Consequently the presence of tubercle bacilli in the milk of cows that reacted to the tuberculin test but without showing any clinical indications of the disease was investigated by means of very extensive experiments.

The transmissibility and the transformability of the human, bovine, and avian types of tubercle bacilli was made the subject of study; also the different methods of immunization; the retention of vitality by tubercle bacilli that chance to be lodged in cheese, butter, or eggs; and the occurrence of the different types of tubercle bacilli in cases of natural infection of birds and animals in captivity.

Other investigations on tuberculosis have thrown much light on the relation between the location of tuberculous lesions in the animal body and the channels through which tubercle bacilli are expelled and disseminated from the bodies of tuberculous animals; on the persistence of the life and virulence of tubercle bacilli under different conditions and in different media; on the relation between tuberculosis of lower animals and human beings; on the relation between tuberculosis of cattle and tuberculosis among other species of animals; on the persistence of tubercle bacilli in a latent or semilatent state, without loss of virulence, in the tissues of living animals; on the causes that are responsible for the increased frequency of tuberculosis among hogs, etc.

The practical significance of some of this work is shown, for example, by the widespread interest taken in those studies on the elimination and dissemination of tubercle bacilli by tuberculous animals, which led to the discovery that tubercle bacilli are of common occurrence in the feces of even apparently healthy tuberculous cattle. This discovery at once offered an explanation for the occurrence of tubercle bacilli in the milk of tuberculous cows with healthy udders, and made it possible to prove definitely that the feces of tuberculous cattle are a common cause of tuberculosis among hogs.

HOG CHOLERA.

For many years the Bureau of Animal Industry carried on a systematic study concerning the cause of hog cholera. These investi-

gations culminated in 1903 in the discovery that this fatal disease is caused by a microorganism of such minute size that even the most powerful microscopes do not enable us to determine its form or structure. This discovery of the true cause of hog cholera enabled the department's investigators to attack the problem of prevention with intelligence and with some prospect of success.

Following the discovery of the true cause of hog cholera, the bureau succeeded in producing a protective serum from immune hogs which serves to prevent an attack of hog cholera in animals which would certainly succumb except for the serum inoculation. This antihog-cholera serum has been patented and assigned to the free use of the people of the United States. It has been found that this serum can be produced at a cost sufficiently low to warrant its employment in practice.

The department, through bulletins and other special notices, has advised all the States of the Union of this discovery and has urged them to undertake the manufacture of this serum for the benefit of farmers. At the present time 28 States have done more or less work along this line, and more than 1,000,000 hogs have been given the protective inoculation with most satisfactory results.

In order to understand what the discovery of this serum may mean to the people of this country, we need merely to consider that the value of property in swine in the United States exceeds $500,000,000, and that a conservative estimate shows that the average yearly loss from hog cholera must amount to more than $18,000,000.

The investigations of the department have thus placed the people of the country in a position to save all, or a greater part, of this loss and, furthermore, as the serum may be used to prevent hog cholera, farmers should soon be in a position to raise greatly increased numbers of hogs without being deterred, as they are now, by the fear of this destructive disease.

GLANDERS AND OTHER DISEASES.

The diagnosis of glanders, Malta fever, dourine, and infectious abortion by the application of complement-fixation tests to the blood serum is one of the recent achievements that has a far-reaching importance. By this method it is now possible to diagnose these diseases accurately and promptly. This is a great improvement over the uncertainty of former methods. About 2,500 complement-fixation tests were made during the past year.

Infectious abortion is a scourge of the cattle industry at the present day, and has been a subject of special investigation during the past two years. With prevention in view very extensive experiments have been made for the purpose of discovering some effective

and practicable method of immunizing exposed animals against this disease.

The demonstration of the occurrence of the bacillus of infectious abortion in market milk, of its continued elimination with milk by cows that have aborted, and that it causes well-marked, characteristic lesions in small experiment animals, may throw much light on the important question of infectious abortion among animals, and has added another argument to the many that have been discovered in recent years in favor of the general pasteurization of the public milk supply, as it is not yet known in what relation the abortion bacillus, which can affect many species of animals, may stand to human health.

INVESTIGATING LOSSES OF SHEEP.

Losses of sheep on the ranges of the West, through eating poisonous or narcotic plants such as the loco weed, and also from the diseases known as bighead and necrobacillosis, have been very heavy. The causes of these losses are being investigated by men of the Bureau of Animal Industry who have been detailed to the affected regions in order that they may study the outbreaks as they really occur.

DISEASES OF HORSES.

Another matter which receives attention in the midst of the affected area is swamp fever of horses, which occurs most seriously in the lowlands of the river bottoms in the northern prairie States. Forage poisoning of horses in the Middle West, as well as in several of the Atlantic States, has for several years proved to be a baffling and destructive disease and has received careful study, both in the field and in the laboratory. Dourine among horses has suddenly appeared on three or four occasions and has demanded prompt attention because of its contagious character.

RABIES OF DOGS AND OTHER ANIMALS.

The supply of dogs and other animals affected with rabies seems to be inexhaustible, and it is therefore necessary to make examinations of suspected material without any cessation. It is safe to say that many human lives have been saved through prompt and accurate diagnosis in the case of animals that had bitten people, the persons thus being informed when it was advisable for them to resort to the Pasteur treatment to prevent the development of hydrophobia.

Diseases of fowls and of pet stock are very important and are so frequently referred to the bureau that one or more men are kept constantly employed in dealing with them.

SPECIFIC REMEDIES.

Bacterins, antitoxins, and numerous biological products for the prevention or treatment of various animal diseases are being placed upon the market in great profusion, and it has become necessary that some supervision should be placed over these preparations, as the chance for marketing fraudulent, worthless articles is so attractive to the unscrupulous that certain men are availing themselves of the offered opportunity for reaping a harvest. A beginning has been made in standardizing these products, and the value of all such products should be determined before they are placed on sale before the public.

For many years the bureau has furnished free of charge to official veterinarians, health officers, etc., tuberculin for the diagnosis of tuberculosis in cattle and mallein for the diagnosis of glanders in horses. In 1897 there were so furnished 7,000 doses of tuberculin and 1,400 of mallein. In 1912 the quantity of tuberculin amounted to 329,000 doses and mallein 135,000 doses. During the 16 years approximately 2,000,000 doses of tuberculin and 500,000 doses of mallein were supplied to State, county, and municipal officials. The tuberculin distributed has been used almost exclusively for testing dairy cattle for tuberculosis. The distribution by the department has enabled State officials to secure this reliable diagnostic agent promptly upon request, and they have employed it in various campaigns to remove tuberculous animals from dairy herds.

There are, of course, some dairy herds which are free of tuberculosis; there are others which are badly infected. The average percentage of tuberculous animals in dairy herds, as shown by these tests, extending over the past 16 years, is little if any below 5 per cent. It is certainly true that in most cases where tuberculous animals have been discovered by this test steps have been taken to remove the danger which they presented. It must therefore be assumed that this distribution of tuberculin has resulted in the removal from dairy herds of not far from 100,000 infected animals. The removal of these animals, of course, is of great importance to the public health and is also of economic importance on account of the menace to the health of the other animals in the herd.

Antigens for use in the various complement-fixation tests and precipitating sera for use in the diagnosis of glanders, Malta fever, anthrax, etc., have been prepared and furnished ready for use to laboratory workers in various States of the Union. In this class of materials may be included a bacterin preparation for the treatment of the buffaloes in the Yellowstone Park, which have been decimated by attacks of hemorrhagic septicemia.

A supply of stock cultures comprising many of the pathogenic organisms commonly producing disease in animals are kept constantly in cultivation and are at all times available for supplying scientists who desire to cultivate a collection of bacteria and for schools that need them for study and comparison.

ANIMAL PARASITES.

Some important work has been done with regard to animal parasites and parasitic diseases. The Zoological Division has worked out the life history of the stomach worm of sheep, a parasite which entails a loss of millions of dollars annually to the sheep industry of this country. This loss may be avoided or minimized only by the adoption of preventive and remedial measures based upon a knowledge of the life history of the parasite.

The presence of the gid parasite of sheep in the United States was discovered. The importance of eradicating this parasite has been pointed out, and a careful watch is kept for new centers of infection in order that more stringent measures may be taken in case the parasite should show a tendency to spread beyond its present restricted limits of distribution.

The common occurrence of a tapeworm cyst in the muscles of sheep has also been discovered. Investigations have shown that this cyst is the intermediate stage of a dog tapeworm, hence not dangerous to man. The presence of these cysts in mutton, however, renders it undesirable as food, and a considerable loss thus results to the meat supply of the country.

A common stomach worm of the horse has been found to be transmitted by the house fly. The infection passes from the manure of infested horses to fly larvæ breeding in the manure, and the full-grown flies developing from these larvæ in turn transfer the parasites to horses.

The discovery of the New World hookworm of man and its extensive distribution in the United States was made by a scientist of the Bureau of Animal Industry who has since gone to another branch of the public service. His far-reaching investigations were begun before he left this department.

Numerous new species of parasites of varying degrees of economic importance have been discovered in the course of the bureau's work in parasitology, and a complete index to the extensive literature concerning parasites has been compiled and published.

BENEFICIAL RESULTS WIDELY DIFFUSED.

It can readily be seen that the activities and benefits of these scientific investigations extend into every section of the country, and that the work performed does much to check and to overcome the ad-

vance of every contagious epizootic as well as to cure the animal that is suffering from a less dangerous ailment. The lives of countless animals are preserved each year, and because of the investigations of materials which form an important part of the daily food of the people of the country, human lives are also helped and lengthened and in many instances sickness and death are prevented.

EXPERIMENTAL FARMS.

Some of the investigations require farm conditions. In 1897 the Bureau of Animal Industry had for this purpose an establishment for which the name "experiment station" was a misnomer. It was located on a rented tract of land with an area of less than 6 acres. The available buildings for housing animals and laboratory purposes were a few one-story frame structures which could be duplicated, together with their entire equipment, for about $3,000, and the duplication of which at any price, for any purpose, would be extravagant.

The experiment station is now located on a 50-acre tract of land owned by the Department of Agriculture, at Bethesda, Md. Its laboratory is a $25,000 fire-proof building, and the entire property, including buildings, roads, water, and sewage systems, etc., is worth at least $75,000. This station is used for investigations concerning diseases of animals, and is well equipped for the purpose.

The bureau also has a farm at Beltsville, Md., for investigations in animal husbandry and dairying. This farm, which was bought by the department in 1910, consists of 475 acres of land, and is being equipped for the work for which it is intended. This farm affords facilities that have long been needed, and is expected to yield valuable results to the stock-raising and dairy interests of the country.

BIOLOGICAL SURVEY.

EARLIER DUTIES.

During the past 16 years the work of the Biological Survey has been greatly enlarged and its field broadened, as is shown by a comparison of appropriations and number of employees. The appropriation for the fiscal year 1897 was $20,560, while that for 1913 was $191,400; the number of employees increased from 23 in 1897 to 97 on July 1, 1912. In 1897 the office, then known as the Division of Biological Survey, was charged with two main lines of work—investigation of the geographic distribution of mammals and birds and studies of the food habits of the useful and injurious species.

IMPORTATIONS OF LIVE BIRDS AND WILD ANIMALS.

In 1900 under the act regulating importation and interstate commerce in birds and game the survey was given supervision of all

importations of live birds and wild animals. Under a system modeled after that of western Australia, and in cooperation with the Customs Service of the Treasury Department, a system of permits was carried into effect which has made it possible to trace each consignment imported from abroad, and to exclude any injurious species.

For the fiscal year ending June 30, 1912, the total number of mammals imported from abroad was 5,457, and the total number of birds 457,077. In other words, we are now importing foreign birds (chiefly cage birds) at an average rate of more than 1,000 a day, and a systematic record is kept of all such importations at each of the entry ports of the United States and in Hawaii.

No other country has undertaken so comprehensive a system to prevent the introduction of species which may become injurious to agriculture. Congress, recognizing the increased field of operations of the office, raised the division to the rank of a bureau on July 1, 1905.

DISTRIBUTION AND HABITS OF NATIVE MAMMALS AND BIRDS.

The basis of most of the work is scientific investigation, and in this field the most notable accomplishments have been the systematic collection and publication of data regarding the distribution and habits of native mammals and birds, and the preparation of maps showing the natural life zones of the country. Each of these zones is especially adapted to the growth of special crops and marks the limits within which certain varieties of fruits and cereals produce the greatest yield or beyond which they are not likely to be commercially successful.

Maps showing the ranges of individual species have also been published, and have proved useful in cooperative work with the Public Health Service in outlining the range of mammals which carry the tick responsible for the deadly spotted fever in the Bitter Root Valley, Mont., and the area occupied by the ground squirrels in California which transmit bubonic plague.

Maps have also been prepared showing the distribution of other species of ground squirrels, of pocket gophers, prairie dogs, wolves, and coyotes, all of which are extremely destructive to stock and agricultural interests in the West. The survey has mapped the ranges, determined the abundance, and studied the habits of many of the North American mammals and birds, and the knowledge thus gained makes it possible to cope with most of the economic problems in which native species are involved. Detailed studies have been made of certain regions of special interest, notably of Mount Shasta, Cal., and of the States of Colorado and Arkansas. A report has been

published on the birds of Arkansas, forming the first complete list of the birds of that State ever issued. Comprehensive lists of the birds of Alabama and Texas are now in course of preparation. The latter, on account of the richness of the Texas fauna, will include more than one-half of the species known from North America north of Mexico.

FOOD HABITS OF BIRDS.

Careful studies have been made of the food habits of birds considered injurious and of many species that are known to be beneficial. More than 50 species of birds have been found to destroy the cotton boll weevil and 31 have been found to feed on the alfalfa weevil which has recently become so destructive in Utah. Special studies have been made of the food of birds in the fruit-growing districts in California and of special generally distributed groups, such as the flycatchers, grosbeaks, shore birds, and waterfowl. A summary of some of these studies, entitled "Common Birds in Relation to Agriculture," has proved one of the most popular bulletins ever issued by the department, more than half a million copies having been distributed in recent years.

SPECIES INJURIOUS TO AGRICULTURE.

Much attention has been devoted to species injurious to agriculture, and methods have been devised for destroying English sparrows, wolves, coyotes, moles, rats, ground squirrels, and prairie dogs. When it is considered that 32 prairie dogs will eat as much forage as one sheep and 250 prairie dogs as much as one cow, it can readily be seen how important is the destruction of these animals on grazing lands in the West. Even the crawfish, which are destructive in cotton fields in certain sections in Mississippi, have received attention, and methods of destroying them with bisulphide of carbon have been devised. This work has by no means been confined to experiments on a small scale. In cooperation with the Forest Service, the prairie dogs on considerable areas in the National Forests of Colorado have been poisoned, and the mice, chipmunks, and other rodents have been destroyed on seed plots and extensive tracts where the work of reforestation has been undertaken on the forests in the West.

GAME PROTECTION.

In connection with the work of game protection the Biological Survey is called upon to issue permits and inspect shipments of wild animals and birds imported alive from foreign countries; to enforce the laws relating to interstate commerce in game; to enforce the law relating to protection of birds on national bird reservations; to ad-

minister 56 bird reservations and one or two big game reservations; and to cooperate with the several States in the protection of game.

These duties, authorized by act of Congress of May 25, 1900, have considerably broadened the field of work and have brought the survey into close touch with several of the other executive departments and with most of the State fish and game commissions. Supervision of the importation of foreign birds is carried on in cooperation with the Treasury Department, and in the maintenance of the bird reservations cooperation of at least six other departments—Interior, Treasury, Justice, War, Navy, and Commerce and Labor—is occasionally necessary.

Through cooperation with game commissions and associations of the various States and through its publications the department has been able to advance the cause of game protection materially, and in some instances to mold public opinion on certain matters of general interest. The last decade has witnessed a wonderful advance in game protection in the United States, and in this movement the Biological Survey has taken a prominent part. Native species have been almost entirely eliminated from the cage-bird traffic and have been largely eliminated from the plumage sold in this country for millinery purposes. Restrictions on export and sale have greatly reduced the enormous shipments of game to market which were so common a few years ago. A system of hunting licenses has been adopted in most of the States, and the number of States which have provided game commissions intrusted with enforcement of game laws has increased from 31 in 1900 to 43 in 1912.

DIVERSIFIED DUTIES.

Under its present organization, the Biological Survey is charged with such diversified duties as investigations relating to destruction, migration, and economic relations of birds and mammals; prevention of the introduction of species injurious to agriculture; maintenance of about 60 reservations; solution of problems involving the permanent preservation of buffalo, elk, antelope, and other big game and of numerous species of birds. Recently a movement has been started to intrust the department with the supervision of the protection of migratory birds, and bills providing for this new work have been introduced in Congress and have been favorably reported by the respective committees in the House and Senate.

WEATHER BUREAU.

ENORMOUS DEVELOPMENT.

Owing to the nature of its duties, the Weather Bureau is probably the most widely known bureau of the Department of Agriculture, and as the weather enters into practically every phase of human

activity the extent to which the information it collects and distributes can be used to advantage and profit is scarcely to be limited. In attempting to speak, therefore, of the extension of its benefits during the past 16 years, it is not possible to do more than to touch on the more striking features of its work.

The benefits to be derived from its forecasts, warnings, and miscellaneous reports depend largely upon the extent to which the general public has been educated in the use of the information furnished. That there has been an increase of appreciation on the part of the people of this country in this respect was fully brought out several years ago when the Weather Bureau made inquiry regarding the uses to which weather information was applied. The replies received showed numerous special applications of the information to individual pursuits and industries that had not even been suspected by the Weather Bureau.

Since 1870 the Federal Government has maintained a service having for its objects the forecasting of weather conditions throughout the United States. During the first 20 years of its development the work was conducted by the Signal Corps of the Army, but in 1891 the service was reorganized and the present Weather Bureau was established as a branch of the Department of Agriculture.

With the inauguration of the meteorological service in 1870, under the control of the War Department, there were established 25 regular observation stations. In 1896–97 this number had been increased to 131. At the present time the Weather Bureau has 193 regular stations of the first order, which take and telegraph observations twice daily.

A further general idea of the development of the service may be obtained from a comparison of the annual appropriations for its maintenance. In 1870 the Secretary of War set aside the sum of $20,000 for the first year's work in maintaining the 25 stations then established. In 1896–97 the annual appropriation for the Weather Bureau was $883,772, while the sum appropriated by Congress for the maintenance and operation of the Weather Bureau in all its ramifications during the fiscal year ending June 30, 1913, was $1,619,680.

EXTENSIONS OF OBSERVATIONS AND FORECASTS.

Prior to 1897 the forecaster had under observation twice each day the atmospheric conditions over the area comprising the United States and extreme southern Canada. At the outbreak of the Spanish-American War in 1898 the field of observations was extended to include the West Indies, where the majority of the violent tropical storms that devastate the southern coasts of the United States

make their appearance. In the same year reports were received for the first time from Mexico, and in later years the establishment of a number of stations in the Rocky Mountain and plateau regions afforded much needed information to the forecaster. In 1900 the daily survey of atmospheric conditions was extended to the British isles, continental Europe, Bermuda, and the Azores, through the cooperation of the meteorological services of those countries, and in 1907 the field was further extended to include Iceland, Asia, and Alaska.

At the present time there is prepared each morning in the forecast room of the central office of the Weather Bureau a chart showing the atmospheric conditions in middle latitudes around the northern hemisphere. No other meteorological service prepares a world-wide weather map. This chart not only affords material aid in the preparation of the daily forecasts but has made possible the making of forecasts for a week in advance.

WEEKLY FORECASTS.

The weekly forecasts are given wide publicity through the press, and their accuracy has been the subject of much favorable comment. This extension of the forecast period marks the greatest advance of weather forecasting in recent years. That the enlarged survey is also an important aid in the preparation of the daily forecasts is attested by the following table, which shows the increase in the percentage of accuracy for the year ending June 30, 1912, over the year 1893:

1911						1912					
July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
7.2	12.8	1.7	1.6	4.0	6.4	6.1	4.2	3.9	5.2	3.5	5.8

The annual percentage of verification for the 12 months ending June 30, 1912, was 88.5, or 7 per cent higher than in 1893.

USE OF THE RADIOTELEGRAPH.

During the hurricane seasons of 1910 and 1911 reports of wind, barometer, and weather conditions were received by radiotelegraph from vessels in the Gulf of Mexico and the Caribbean Sea and off the south Atlantic coast, and on two occasions these reports gave the first indications of the formation of hurricanes in those regions. This was the first successful effort to employ the radiotelegraph in weather forecasting.

The service is at present in successful operation on 50 vessels plying the Atlantic Ocean from New York to West Indian and southern ports, and the Gulf and Atlantic between New Orleans and the West Indies, and it is now reasonably certain that no hurricanes will reach our southern coasts unannounced.

A similar service has been partly inaugurated on the Pacific Ocean, where cooperating vessels make daily weather reports to the Weather Bureau officials at San Francisco and Portland, while stations in Alaska and the Aleutian Islands make daily reports of weather conditions by wireless.

There is also under consideration the extension of the field of observations to the north Atlantic steamship routes by means of radiotelegraphy, which will make possible the issue of warnings concerning weather, winds, and storms over that region for the benefit of shipping.

A still more ambitious project, growing out of the deliberations of the International Radiotelegraphic Conference, held in London, England, last June and July, has in view the taking of meteorological observations by all trans-Atlantic steamers, those taken east of the fortieth meridian to be forwarded direct to some point in Europe (London or Paris), and those taken west of that line to be sent to Washington. It has also been recommended that five vessels be equipped for the exclusive purpose of taking observations in the West Indian waters during the hurricane season from June to November, at which time the certainty of receiving daily reports will be particularly valuable in insuring the safety of vessels at sea.

STORMS OF TROPICAL ORIGIN.

Of the severe storms of tropical origin that visited the eastern and southern coasts of the United States during the last 16 years, warnings were in all cases issued in advance of their arrival. Probably the most destructive was the Galveston hurricane of September, 1900, when 6,000 lives were lost, and damage to the extent of $30,000,000 inflicted. In 1909 and 1910 severe hurricanes visited the Florida Peninsula, but owing to the accurate and timely warnings of the Weather Bureau comparatively little damage resulted. Hundreds of employees of the Florida East Coast Railway at work in exposed locations along the keys at that time, as well as barges and other movable property, were removed to places of safety as a result of warnings given by the Weather Bureau.

COLD-WAVE WARNINGS.

The warnings of those sudden and destructive temperature changes known as cold waves are probably next in importance to the storm and hurricane warnings. These warnings are issued from 24 to 36

hours in advance of the cold wave, and are often of immense value. During the severe cold wave of January 1–5, 1896, which overspread nearly the entire United States east of the Rocky Mountains, the warnings were issued 36 hours in advance and resulted in saving over $3,500,000 through the protection of property from injury or destruction.

Among the successful weekly forecasts that have been issued in recent years those of July and December, 1911, were particularly prominent. That of July successfully announced the breaking up of a hot wave that had prevailed for some time over the Eastern and Middle Western States. Again, on December 24, the weekly forecast stated that, following a prolonged period of high temperature, severe winter weather would visit the United States by the beginning of 1912. The coldest weather in years occurred in the southern plateau region, freezing temperatures were recorded in California, a cold wave of marked intensity prevailed over the Plains States and Mississippi Valley, and the change to colder was felt to the Gulf and Atlantic coasts.

DISTRIBUTION OF FORECASTS AND STORM WARNINGS.

The distribution of forecasts and of cold-wave, frost, and storm warnings, for the benefit of agriculture and commerce, and in a special way for the protection of fruit, cranberry, tobacco, sugar-cane, and other crops, has been greatly extended during the past 16 years. The following table compares the distribution to places or addresses in 1896 with that given in 1912:

Issue of forecasts and warnings.	1896	1912
At Government expense:		
Forecasts (daily)	1,581	2,069
Special warnings only	598	946
Emergency warnings	3,481	5,154
Without expense to Government:		
Mail (forecast card)	22,642	89,512
Rural delivery		30,539
Telegraph and telephone	1,712	5,462,212
Railroad telegraph	3,550	451
Railroad train service	1,939	2,343
Total	35,503	5,593,216

As will be observed, the main extension has been accomplished by means of rural free delivery and telephone service. The Rural Free Delivery Service was inaugurated in 1900 through the hearty cooperation of the Post Office Department. Owing to the prosperous condition of the farming interests, the telephone is rapidly supplanting the rural card distribution. Through the cooperation of the telephone companies, the telephone has become, next to the daily newspapers, the most extensive and expeditious means of disseminating the daily weather information; by this means more than 5,000,000 telephone subscribers get the forecasts daily. Moving-

picture screens are also being utilized in eight large cities for displaying the weather forecasts for the information of the general public.

The forecast distribution already described does not include that effected through the issue of the daily weather maps. In 1896 these maps were issued at 75 stations, having an annual output of more than 3,000,000 maps. At present the map is printed at 58 stations, having an annual issue of over 6,000,000 maps. The decrease in the number of stations issuing the regular station weather map has been brought about through the substitution at many points of a newspaper map, generally known as the commercial map. A map of this character was first printed at the Centennial Exposition in 1876, and in 1896 it was being published in four papers, having a combined circulation of 110,000 daily. In 1910 a plan for its issue under improved methods was brought to the attention of the press of the country, and the officials of the bureau were urged to make every effort to obtain a wide circulation of the publication by this means. At the end of four months 65 papers were publishing the map, and by the following January 100 dailies were making this an important news item. In July, 1912, the commercial map was being prepared at 91 stations and furnished to 147 daily newspapers, with an annual circulation of 985,000,000 copies.

At the beginning of 1896 there were 173 storm-warning display stations in operation. The number has gradually been increased, until in 1912 there are 619 stations displaying signals to warn mariners of approaching storms. Twenty-five of the stations also disseminate storm warnings by radiotelegraph to vessels at sea.

FROST STUDIES AND WARNINGS.

Since 1896, 89 special stations have been established in the fruit sections in connection with the study of frost formation and to assist in making more accurate forecasts and frost warnings for mountain orchard districts, cranberry marshes, the northern vineyards, and deciduous fruit sections. Prior to that time frost warnings were based on reports of general conditions only, no data from the fruit districts being available from which the influence of local conditions of topography and air drainage could be taken into account. The extension of this special warning service into new districts is shown in the following table:

Districts receiving special frost warnings.

In 1896.	In 1912.		
Florida.	North Carolina.	Utah.	Wisconsin.
Louisiana.	Florida.	California.	Ohio.
Texas.	Louisiana.	Oregon.	New Jersey.
California.	Texas.	Washington.	Massachusetts.
	Colorado.	Idaho.	

Investigations are now being carried on in the mountain orchard districts of North Carolina with a view of determining the limits of the thermal belts in the Blue Ridge Mountains. Ten orchard stations with 29 substations have been established, and it is proposed to extend the service by the establishment of 10 additional stations on other spurs of the mountains.

Under the Portland (Oreg.) district frost investigations are carried on in the Rogue River Valley, Umpqua Valley, Stuck River Valley, Yakima Valley, Snake River Valley, Boise Valley, and Hood River Valley. The official at Portland hopes to extend this service by the establishment of 4 stations in the Boise section, 2 in Hood River, 2 in Riddles, and 5 in North Yakima. In the Lewiston (Idaho) district 3 stations are in operation. The San Francisco district has 5 stations around Los Angeles and in the northern and central counties, where the annual value of the citrus-fruit interests is placed at $40,000,000. During the past year it is estimated that by the timely warnings of the bureau at least $20,000,000 worth of fruit was saved. An extension of this service by the establishment of 12 fruit district stations in the San Gabriel Valley, 2 in the Santa Clara Valley, 3 in the San Joaquin Valley, and 5 in the Sacramento and Bay Valleys has been recommended.

In the Salt Lake district experiments for the protection of fruit by means of canopies have been carried on at Provo, and stations have been established at four other places in connection with investigations looking to the protection of vegetables and alfalfa from frost. Under the Grand Junction district is the service in the Grand River and Gunnison Valleys with five stations. Four stations have been established in the Columbus (Ohio) district, and experimental work has been started for the protection of vineyards. In the Jacksonville district the frost-warning service for the protection of truckers and citrus-fruit growers has been established with four stations in operation.

The special cranberry service gives warnings of frost in the bogs of the Cape Cod (Mass.) district, where five special stations have been established under the supervision of the official at Boston; and the bogs in Wisconsin, with three stations under the supervision of the official at Chicago. A station has also been established at New Lisbon, N. J., and another at Seaview, Wash.

RIVER AND FLOOD SERVICE.

On July 1, 1897, there were 150 river stations operating under the river and flood service of the Weather Bureau. The success of the river forecasts during the great flood of 1897 created a demand for the extension of the service that has never been fully satisfied, but

increases have been made gradually until at present there are about 425 river and 25 rainfall stations distributed along all except the very smallest rivers of the United States.

The river forecasts issued daily by the Weather Bureau have contributed in no small measure to the success of navigation in the great inland waterways of the country. Flood warnings are issued whenever necessary, giving specific information as to the time of arrival of floods, the highest stages expected, and the duration of the floods. This information is of the greatest value to agriculture and many other interests.

Previous to 1897 the forecasts rarely attempted to indicate the exact heights that the floods would attain, but study and investigation have resulted in constant improvement until exact flood forecasts can now be made for periods from one day to four weeks in advance. For several years the river and flood service has been engaged in the preparation of forecast schemes for all the principal river systems—in other words, in developing rules applicable to forecasting in each of the rivers, and making a permanent record of these rules for future use. Schemes of this character have already been completed for the Ohio River and its tributaries, and the study of the Mississippi River is now under way.

During the Mississippi flood of 1897 property to the value of about $15,000,000 was saved through the Weather Bureau flood warnings, and as much during the flood of 1903, while during the great flood of 1912 a saving exceeding $16,000,000 was reported. During a single flood in the Sacramento Valley of California in 1909 property to the value of $300,000 was saved through the warnings of the Weather Bureau, and similar instances are matters of frequent record. The work has kept pace with the development of the country, and its usefulness is limited only by the amount of money that Congress is willing to provide for its maintenance.

MARINE METEOROLOGICAL CHARTS.

Upon the recommendation of the Board on Wireless Telegraphy in July, 1904, and approved by the President, the ocean meteorological work and the collection of observations from vessels at sea, formerly under the Hydrographic Office, Navy Department, was transferred to the Weather Bureau. At that time 570 vessels of all nationalities were taking observations and rendering monthly reports. The number cooperating with the Weather Bureau on July 1, 1912, was 2,291.

The observations thus collected are used in the preparation of marine meteorological charts of the oceans and the Great Lakes. These charts are given free issue to vessel captains, marine interests,

libraries, and other individuals or institutions interested in the marine meteorological work of the Weather Bureau.

The charts of the north Atlantic were first published in 1909, with a monthly issue of 3,000, which has since been increased to 6,000. The north Pacific issue in 1909 was 1,500, while the issue at present is 3,100; that of the south Atlantic has been increased from 1,000 to 2,230, the south Pacific issue from 1,500 to 2,250, the Indian Ocean edition from 1,800 to 2,250, and that of the Great Lakes from 1,000 to 1,200.

VESSEL-REPORTING SERVICE.

The Weather Bureau maintains vessel-reporting stations at Block Island, Cape Henry, Sand Key, Southeast Farallon Island, Point Reyes Light, North Head, Port Crescent, and Tatoosh Island, where, in addition to their meteorological duties, the officials are required to report all wrecks, marine disasters, etc., and to transmit communications between owners, underwriters, and others interested in marine matters. As an instance of the enormous volume of work of this character done at these stations, it may be mentioned that during the year 1912 the Weather Bureau station at Cape Henry, Va., reported 19,876 vessels as having passed that station.

COOPERATIVE OBSERVATIONS AND CLIMATOLOGICAL REPORTS.

It was early apparent that only a limited number of telegraphic observation stations were required for forecasting purposes. For establishing and recording the climatic conditions of the country, however, it was necessary that a much wider distribution of observation stations be provided. This gave rise to the establishment of the climatological service of the bureau, which was brought about by enlisting the cooperation of public-spirited citizens in the formation of a widespread system of observations. At first a full equipment of the few scattered stations with standard instruments was not possible, and the results obtained from many of the early observations were unsatisfactory. During the last 10 or 15 years, however, the equipment has been improved until now practically all stations are supplied with accurate and well-exposed instruments.

In the earlier years this system covered only the older settled districts, but the observation stations were gradually extended into the far western mountains and valleys, and even into the island dependencies and Alaska. At the present time no important area of the country is without the means of approximating its main climatic features.

During the past 16 years the number of cooperative stations has increased from less than 3,000 to slightly more than 4,000, practically the entire extension having been effected in the trans-Mississippi districts.

PUBLICATIONS.

With the great industrial developments of recent years has come a better knowledge of the dependence of most enterprises upon weather changes and climatological conditions. To meet the demands for information arising from a recognition of this fact it has become necessary to issue many climatological publications. Prior to about 1896 these were decidedly meager in contents, but since that time the introduction of printing facilities at a number of the more important stations has enabled the preparation of elaborate reports, which have rapidly increased in circulation with each succeeding year.

The most important of these is the Monthly Weather Review, containing statistics of weather conditions for more than 4,000 different points in the United States; the monthly edition of separates of the review now exceeds 14,000 copies.

The annual reports of the chief of bureau contain condensed summarized data for the year from all observation stations, together with charts and tables of many of the important elements.

The National Weather Bulletin summarizes the weather conditions for each week during the crop-growing season and for each month during the remainder of the year.

The snow and ice bulletins issued during the winter months indicate the protection afforded the cereals and grasses by the snow cover and furnish data regarding ice in the principal rivers and harbors of the country.

Monthly reports on the snowfall in the mountain States are issued during the winter for the benefit of irrigation and water-power interests, and daily bulletins of the weather over the great cereal and cotton-growing States during the period of growth and harvest are given wide distribution.

Lastly may be mentioned the summaries of climatological data for 106 district sections of the United States, having the data arranged in convenient form for the use of hydraulic engineers, water users, and agriculturists. Nearly 300,000 copies of these summaries have been printed in response to the numerous demands.

The total number of climatological publications and reports issued yearly now exceeds 1,000,000 copies.

INSTRUMENTAL EQUIPMENT AND APPARATUS.

At the present time more than 200 stations, maintained for regular telegraphic reports, are equipped with the instruments essential to complete meteorological observations, while a number of special stations established to carry out particular lines of research have also been supplied with the instruments essential to their work. The structural details of most of the instruments have been modified and

improved from time to time, although the general type and design have remained the same.

Besides the improvement in the instrumental equipment at the regular Weather Bureau stations a good type of thermometer shelter is fast being furnished to the cooperative climatological stations, which now number 4,000, and of which 3,100 are equipped with the standard shelter, in addition to the thermometers and rain gauges used at those points.

Beginning in 1900 the equipment of storm-warning display stations has been steadily improved by the installation of steel towers and the use of high-power oil and electric lights for display of flags and night signals. More than 200 of these towers are in use at the present time.

With the beginning of aerial studies in the winter of 1895, a standard type of construction of the Hargrave box kite was perfected and has been employed without appreciable modification in the subsequent work of the bureau, as well as at a number of European observatories. The same is true in regard to a light form of meteorograph that is sent up with the kites for recording the pressure, temperature, humidity, and wind velocity. In the course of the aerial work several excellent forms of windlass were designed for winding and unwinding the steel piano wire used in the kite ascensions.

Earthquake vibrations have been recorded in a more or less complete manner at the Washington office of the Weather Bureau for many years. In 1903 a modern type of seismograph of superior design was installed. The equipment was subsequently improved by the installation of a more sensitive new type of seismograph designed and constructed in the Instrument Division, and records have been obtained of all the important earthquakes that have since occurred.

Several useful improvements in methods and devices for observing and measuring evaporation were also developed and used in connection with the special evaporation studies conducted by the Weather Bureau in 1907–1909.

Observations of the intensity of solar radiation began with the use of the Ångström pyrheliometer. An improved type of disk pyrheliometer has been developed in the Instrument Division, and this form of instrument is now being used at Mount Weather, Va.; Madison, Wis.; Lincoln, Nebr.; and Santa Fe, N. Mex.

The accuracy of anemometer records at very high wind velocities has never been completely established. This work has recently been undertaken with the aid of a large whirling machine set up at Mount Weather, Va. Through its use a test will be made of all the important types of anemometers at velocities up to and beyond 100 miles per hour.

A special structure of ornamental character was devised in 1908 for the purpose of displaying meteorological instruments and weather

charts in the parks or on the streets of large cities. These kiosks, as they are called, have been installed in 37 of the larger cities of the country and have proved an excellent means of acquainting the average citizen with the way in which the Weather Bureau obtains and distributes its weather information.

EVAPORATION STUDIES.

The formation of the Salton Sea in the desert of southern California by overflow flood waters from the Colorado River afforded an exceptionally favorable opportunity for the study of the general problem of evaporation. A preliminary campaign was begun at Reno, Nev., in 1907, and an elaborate investigation followed during 1908 and 1909 at the Salton Sea, with the primary object of determining an evaporation formula that would be of general application. The results obtained were somewhat negative, indicating that, owing to differing meteorological conditions, the law of evaporation must be established independently for each separate locality. A great mass of valuable data was secured, however, and the work can not by any means be considered a failure.

FOREST AND RAINFALL INVESTIGATIONS.

The problem of the conservation of the natural resources of the country has in recent years become one of the great issues of the day. As might naturally have been expected, honest differences of opinion have arisen in connection with various phases of the question. Probably none has been the subject of more vigorous discussion than that relating to the effect of forestation or deforestation upon water supply and water control, particularly with reference to floods. As the data at hand were apparently not conclusive, the Weather Bureau and the Bureau of Forestry of the Department of Agriculture combined forces in 1910 for a thorough investigation and study of the entire problem, in the hope of arriving at results that would be accepted as authoritative; and two small and similar watersheds in the Rio Grande National Forest in southwestern Colorado were selected as offering suitable conditions for prosecuting the necessary investigations. An elaborate equipment was provided, and observations are now being taken daily over both watersheds. In 8 or 10 years it is proposed to deforest one of the watersheds and then to continue the observations over both for another period of 8 or 10 years. At the end of the second period the results are to be promulgated with such conclusions as are warranted by the facts. Foreign countries have expressed great interest in the experiment, and the final results and conclusions will doubtless prove of much value.

MOUNTAIN SNOWFALL WORK.

For many years hydraulic engineers engaged in the mountainous regions of the West were confronted with discrepancies between precipitation and run-off that were unexplainable at the time. In many localities the total annual run-off would be greater than the total measured precipitation. It was evident, of course, that the measurement of the precipitation was deficient in some way, and it was finally agreed that the trouble was due to the want of snowfall measurements in the high mountains.

Consequently, about three years ago a mountain-snowfall campaign was inaugurated by the Weather Bureau. Special apparatus was devised, and about 275 mountain-snowfall stations were opened. Snowfall measurements were made daily or weekly, according to the locality, and the depth and water equivalent of the snow carefully computed. Later it was found that some portions of the equipment were not entirely suited to the conditions, and improved apparatus has been devised in the form of a shielded rain and snow gauge. As a result of the observations thus secured the difficulties of the hydraulic engineer have already been lessened. The data are now comparable, and computations of future water supply from the winter snows in the mountains can be made with a considerable degree of accuracy.

Provision has also been made for measuring the water equivalent of snow that must be depended upon to supply water for irrigation purposes in a portion of the subarid West. A special snow survey in Utah has demonstrated the possibility of making a reasonably accurate forecast of the amount of water that will be available each season for the uses of the irrigation farmer. If the supply promises to be greater than usual, water-supply companies can arrange to dispose of more water and farmers can cultivate more land. On the other hand, if the supply promises to be less than usual, the water distribution can be lessened and the area under cultivation be restricted. The great utility of such advance knowledge is readily apparent.

BAROMETRY, THERMOMETRY, AND CLOUD OBSERVATIONS.

In Volume II of the Annual Report of the Chief of the Weather Bureau, 1900–1901, is published the "Barometry of the United States and Canada." All the barometer data were reduced to a homogeneous system of station normals computed for the epoch January 1, 1900, requiring in the case of many stations a computation of the record for 27 years. From these computations barometer tables for the reduction of the pressure readings to sea level were computed.

Such a system of normals develops many interesting and important cosmical problems, especially those regarding the seasonal variation of the climate and the forecasting of the weather conditions for longer intervals than at present practicable.

In 1907 the daily temperature normals, computed for a period of 33 years, 1873 to 1905, inclusive, were published.

In 1894, in accordance with the recommendation at the International Conference at Munich of 1891, resolutions were passed by the committee on cloud observations, inviting all countries to cooperate in cloud observation work beginning May 1, 1896. The Weather Bureau conducted these observations at 15 stations throughout the United States, and from these observations deductions were made as to the height of all classes of clouds. The "Report on the International Cloud Observations," May 1, 1896, to July 1, 1897, was published as Volume II of the Report of the Chief of the Weather Bureau, 1898–99.

MOUNT WEATHER (VA.) RESEARCH OBSERVATORY.

The plan to found an observatory at Mount Weather, Va., for research work took definite form in 1903, in which year a site was obtained on the summit of the Blue Ridge, 6 miles south of Bluemont, Va. The main building was erected in 1904, but in October, 1907, it was destroyed by fire. In 1909 a fireproof structure was erected on the foundation of the old building, a central heating and power plant was also constructed, and several buildings which had been begun at an earlier date were completed.

While the buildings were being constructed scientific work was carried on under difficulties. Surface meteorological observations were begun in November, 1904, and the results have been telegraphed to Washington daily since that time. The years 1905, 1906, and part of 1907 were spent in installing and testing instrumental equipment and in experimental work preparatory to the exploration of the free air, which at that time seemed to be a promising subject of investigation.

EXPLORATION OF THE UPPER AIR WITH KITES.

While some experimental kite flights were made as early as the autumn of 1905 the regular program of daily flights on week days did not begin until the summer of 1907, and it was not until July, 1909, that flights on Sundays were included in the regular program. The effort to get a daily sounding in all sorts of weather conditions has been a sustained and fairly successful one. In the four years, 1909–1912, there were but 39 days on which it was not possible to make a kite flight or captive-balloon ascension. When weather conditions were not favorable many of the flights naturally extended

but a short distance into the air, thus making it impossible to follow the changes from one day to the next when the flights were of unequal altitude. In the five years' campaign, however, the observatory has succeeded in locating the dangerous sectors of a storm and in roughly determining from surface conditions when it is unsafe to navigate the air. The service thus rendered to the science of aviation will be more fully appreciated as time passes.

It may properly be said that the kite force at the Mount Weather Observatory brought the art of kite flying for meteorological purposes to the highest state of proficiency ever attained in this or any other country. On May 5, 1910, 10 kites, with 11.5 miles of wire, carried a recording instrument to an altitude of 4.5 miles above sea level, the greatest altitude ever reached by a kite. From July 1, 1907, to June 30, 1912, 1,772 kite flights or captive-balloon ascensions were made, mostly in the level below 3 miles.

USE OF BALLOONS.

Meanwhile the observatory had extended its work to the exploration of the region beyond the level attainable by kites. This higher stratum was reached by means of small rubber balloons filled with hydrogen gas. The ascensions were made at points in the West, where of the 91 balloons sent up 79 were recovered with good records. These records afford the only direct measures hitherto obtained of the temperature and moisture of the air at very great altitudes, and also furnish information respecting the direction and speed of the wind for the same region. On September 1, 1910, a balloon launched at Huron (S. Dak.) reached the extraordinary height of 19 miles above sea level, the highest point to which a meteorological instrument has ever been carried and afterwards returned safely to the earth.

These observations at great altitudes suggest that possibly the changes in the weather experienced at the surface of the earth originate in the levels between 9 and 15 miles above and that they are propagated downward. The basis of weather forecasting rests upon the fact that, for the most part, changes in the weather advance from west to east. If, instead of advancing horizontally over stretches of hundreds of miles, the seat of weather activity should rest less than 15 miles above us, the failure to improve forecasts based on a horizontal translation of weather conditions can readily be understood.

Experimental work is still being carried on at Mount Weather on practical problems as they arise. Aerial soundings are being made on special days, with a view of determining the height in the free air to which a diurnal wave in the temperature, moisture, and wind conditions can be traced. It is expected that this problem will be solved within the ensuing year.

AIR DRAINAGE.

In addition to the exploration of the free air by means of kites and balloons, observations on the fluctuations in air temperatures in a cross section of the atmosphere extending from the Shenandoah Valley on the west across the Blue Ridge to the Loudoun Valley on the east have been made. This is a study of air drainage, and is chiefly of interest to horticulturists.

SOLAR RADIATION.

The observatory has also conducted a series of measurements of the amount and intensity of solar radiation, the degree of absorption of the earth's atmosphere, and the polarization of blue sky light, and an automatically recording device has been installed whereby a continuous record is made of the intensity of the radiation received from the sun and sky upon a horizontal surface. Arrangements have also been perfected to secure measurements of solar radiation at other stations in the western portions of the country.

SCHOOL OF INSTRUCTION.

A part of the physical laboratory building has been set apart for use of a Weather Bureau school of instruction, wherein it is aimed to teach new employees of the weather service the duties required of them and to give them actual experience in all phases of the work that is required of assistant observers in any part of the service. This new feature of the work at Mount Weather satisfies a want that has been keenly felt during the last 20 years.

The results of the observations and investigations made at Mount Weather are regularly published in the bulletin of the Mount Weather Observatory, a publication devoted to the discussion of the scientific investigations of atmospheric phenomena.

LIBRARY.

At the central office of the Weather Bureau in Washington is maintained a library of meteorological and climatological literature, in which has been brought together from every part of the world practically all the published material available on these and kindred scientific subjects. In 1896 there were 20,940 books and pamphlets in the library; this number has since been increased to a total of 34,310 volumes.

AGRICULTURAL STATISTICS.

CROP-REPORTING SYSTEM.

One of the first undertakings of this department soon after its creation in 1862 was the adoption of a crop-reporting system for the purpose of ascertaining and publishing monthly information con-

cerning the acreage, the condition of the growing crops, and, soon after harvest, of ascertaining the production and value of the principal crops of the year. It was in charge of the Division of Statistics, now a bureau.

For many years this system remained unchanged, until about 1896 a corps of township correspondents was established as a part of the crop-reporting system to duplicate in form the monthly reports made by county correspondents and State statistical agents.

Late in the nineties an important improvement of the system then existing was inagurated by the employment of a corps of field agents, each one of whom was to cover several States, throughout which he was to travel constantly, so as to be in personal touch with crop conditions and other subjects for which he was to make monthly reports. The improvement of the crop-reporting service due to this innovation was very great and has been increased from year to year by the employment of more field agents, by reducing the area covered by them, and by their increasing skill and accuracy in observation and estimate.

Previous to the summer of 1905 the monthly crop report was made by the chief of the Bureau of Statistics, perhaps after some discussion with members of the office force and during a very few years with one or more of the field agents.

For several years before 1905 the system had improved, but in the year mentioned it broke down in a manner that had hardly been supposed to be possible. The use of the information of the monthly crop report during the growing season, in advance of its publication, had always presented temptation to those in possession of the information to use it in taking advantage of the speculative market in produce exchanges, but the men who could have made such information available had always been trusted and no breach of trust had ever been established against anyone. Besides this, the circumstances under which the crop reports were made were such as to be regarded as making the premature surreptitious private use of the report practically impossible without prompt discovery.

In the spring of 1905 it was discovered that one of the employees engaged in the crop-reporting service in the bureau office had been secretly anticipating the crop report by speculating in produce exchanges in association with other men to whom he had prematurely divulged the report. This caused radical changes in the method of preparing this report and in the circumstances under which the work was done. A crop-reporting board was established, composed of the chief of the bureau as chairman and four other members, whose services were brought into requisition each crop-reporting day from the statisticians and officials of the bureau and the special field and State statistical services. The personnel of the board was changed

monthly; the meetings were held in the office of the chief of the bureau, which was kept locked during sessions, no one being allowed to enter or to leave the room or the bureau, and all telephones being disconnected.

The procedure at the meetings of the board is now substantially as it was in the beginning. When the board has assembled, reports and telegrams regarding speculative crops from State and field agents, which had been placed unopened in a safe in the office of the Secretary of Agriculture, are delivered by the Secretary, opened and tabulated, and the reports by States from the several classes of agents and correspondents relating to all crops dealt with are brought together in convenient parallel columns on final tabulation slips.

The board is thus provided with several separate estimates, covering each State and each separate crop, made independently by the respective classes of correspondents and agents of the bureau, each reporting for the territory or geographic unit with which he is thoroughly familiar. Abstracts of the weather conditions in relation to the different crops by States are also prepared from the weekly bulletins of the Weather Bureau.

With all these data before the board, each individual member computes independently on a separate slip or final computation slip his own estimate of the crop condition or yield of each crop or of the number, condition, etc., of farm animals for each State separately. These results are then compared and discussed by the board under the supervision of the chairman, and the final figures for each State are decided upon.

It has been interesting to note how often the reports of the different classes of correspondents and agents are very nearly identical and how closely the figures arrived at independently by the individual members of the board agree. The estimate by States, as finally determined by the board, is weighted by the acreage figures for the respective States, so that the result for the United States is a true weighted average for each subject.

The present method of making the crop report by a board under the circumstances that surround and confine this board is undoubtedly proof against any premature use of the crop report and has deservedly won the confidence of the public.

In order that information contained in the crop reports may be made available simultaneously throughout the entire United States, they are handed at an announced hour on report days to all applicants and to the Western Union Telegraph Co. and the Postal Telegraph-Cable Co., which have branch offices in the Department of Agriculture, for transmission to the exchanges and to the press. A multigraph statement, also, containing estimates of condition or of

computed or actual production, together with the estimates of former years, is prepared and sent immediately to exchanges, newspapers, and individuals.

Shortly after the issuance of the report it is published in the Crop Reporter, an eight-page publication of the Bureau of Statistics under the authority of the Secretary of Agriculture.

LISTS OF CORRESPONDENTS.

Besides adding the highly important field service to the crop-reporting system, the Bureau of Statistics has built up 15 separate special lists of correspondents, none of which existed 16 years ago, who are called upon from time to time for information regarding various crops, farm animals, and many subjects relating to agriculture.

One of the prominent lists is composed of about 50,000 farmers who are depended upon for various special reports. There is another list of special correspondents on whom dependence is placed for price reports, another for veterinary reports, another for reports relating to live stock on the farm; still another list of correspondents has the specialty of reporting on live stock at market centers. There is a large list of correspondents in mills and elevators. A special list of correspondents is used to collect certain information for each of the crops of tobacco, potatoes, cranberries, broom corn, hops, peanuts, beans, and apples.

If the number of correspondents in these special lists is added to the number of the regular crop correspondents, the total is about 135,000.

VARIOUS SPECIAL REPORTS.

In addition to the regular monthly crop reports, information has been collected and published each month during recent years regarding prices paid to farmers for their leading products, and many special inquiries have been made and their results published, a few of which may be mentioned: Stocks of potatoes in the hands of growers and dealers at specified dates; monthly marketings by farmers of certain leading products; wages of farm labor; values of land and average size of fields upon which corn and wheat are grown; the cost of producing corn, wheat, and oats; causes of damage to leading crops and the relative extent of each cause. The list could be much extended. Results of some of the special investigations are published in bulletins or circulars as well as in the Crop Reporter.

THE CROP REPORTER.

The Crop Reporter was first published in May, 1899. It has been published monthly since that date and has doubled in size—from 4

to 8 pages. Besides being the medium of the publication of the bureau's regular monthly reports, it contains the results of such special inquiries and studies as can be contained therein. It is supplied gratuitously to all who request it. Its principal circulation is among the farmers, and 175,000 copies of each number are now issued.

Prior to 16 years ago, bulletins and circulars on different agricultural statistical subjects had been issued by the then Division of Statistics; but during the 16 years the former division and present bureau have prepared 91 bulletins and 28 circulars.

The increase in the quantity of work accomplished by the Bureau of Statistics during the past 16 years is difficult to arrive at, but it has been very great. The growth of the domestic crop-reporting service, the large number of special inquiries and studies made, the enormous increase in the statistical correspondence of the office, and the preparation of bulletins and circulars may be conservatively regarded as having resulted in a net increase of not less than 400 per cent in the work of the bureau as compared with the volume of work at the beginning of the 16-year period, with an increase of only 21.8 per cent in the office force.

AGRICULTURAL ECONOMICS.

The Division of Production and Distribution has developed a scope of work in directions heretofore little, if at all, explored. It has created a general survey of agricultural conditions and accomplishments in the United States composed of the more important elements of production in quantity and value; of national surplus, deficiency, and consumption; of farm wealth and labor; and of economic achievement and agricultural progress.

The production of important agricultural commodities by the principal countries of the world below and above their respective requirements for consumption, the sources of the supply of such commodities to deficient countries, and the destination of the surpluses of exporting countries, together constitute a subject of unceasing popular interest which is receiving much attention in this division.

The historical aspect of the agricultural production of the United States in particular products and of the surplus or deficiency with regard to domestic consumption has occasioned much painstaking and original work.

The transportation of agricultural products from farm to consumer by wagon, rail, and water, and the costs and methods of marketing are subjects which have been productive of much original work. The division is accumulating much information relating to farmers' associations on the cooperative plan for production, selling, and buying; for fire, live stock, and other insurance; for warehous-

ing; for performing telephone service; and for promoting mutual helpfulness.

Along the lines of work pursued the effort is to establish permanent results of frequent utility to the offices of the department, to the many applicants for information outside of the department, and to the general public. Most of the many bulletins issued from this division are of permanent usefulness and are in current demand; the many special articles that have been prepared for the Yearbook by persons employed in this division are of continuing service; and the threescore statistical tables contributed to the agricultural statistics of the Yearbook are brought down to date annually and are of permanent value.

This is an office of special research and investigation within a field not covered by any office in any other department.

DIVISION OF RESEARCH AND REFERENCE.

The Division of Research and Reference was established a few years ago. Its functions are to prepare the monthly report concerning foreign crops, the preparation of articles for the Crop Reporter, the management and care of the statistical library of the bureau, the compilation of statistics on the yield, annual area, and production by countries of corn, wheat, rye, oats, barley, and flaxseed, and the production of coffee for publication in the Yearbook, and the collation of information from publications of great variety on matters relating to agriculture for the purpose of preparing reports and answering special inquiries.

CHEMISTRY.

MANIFOLD APPLICATIONS OF THIS SCIENCE.

The period from July 1, 1897, to the present time has been one of continuous growth in the activities of the Bureau of Chemistry. During the last 16 years the work has grown in volume and range with steady and rapid progress. It now includes nearly every phase of the application of chemistry to agriculture, to the food and drug industries, and to other manufacturing industries which utilize the products of the farm as raw material.

OFFICE QUARTERS.

The contrast between the equipment at the beginning and at the ending of the period is no less marked. On July 1, 1897, the total appropriation for the Division of Chemistry was $29,500, now it is approximately $1,000,000. Then the total number of employees was 20, now over 500. Then the division occupied a small building, originally a residence, not well suited for laboratory purposes, consisting

of nine rooms; now the bureau occupies a commodious, fireproof building, with 6 stories and basement, of approximately 100 rooms, constructed especially for laboratory work. In addition there are 25 branch laboratories in cities throughout the country in Government buildings or in suitable rented quarters. All the laboratories both in and out of Washington are equipped with a complete line of scientific apparatus well adapted for the work to be done. In 1901 the Division of Chemistry was organized into a Bureau of Chemistry.

METHODS OF ANALYSIS.

In the application of chemistry to agriculture the first and most important step is to develop methods of analysis. This foundation work has been done in cooperation with the Association of Official Agricultural Chemists, which is composed of the official chemists of the United States.

EFFECT OF ENVIRONMENT.

Studies on the effect of environment on the composition of grains and sugar-producing plants have been made by the Bureau of Chemistry and the Bureau of Plant Industry in cooperation with several experiment stations.

SIRUP INVESTIGATIONS.

In 1903 a study was begun of the methods of making a better table sirup from the ordinary sugar-producing plants, such as the maple tree, sorghum, and sugar cane. The work was directed toward ascertaining methods whereby the product could be made purer, better, of a more pleasing appearance, with less tendency to crystallization, and have a greater resistance to fermentative processes.

The manufacturing problems were taken up at Waycross, Ga., where a model sirup factory was erected, a special appropriation by Congress having been made for that purpose. Four important problems were solved:

(1) By arranging two mills tandem, each mill consisting of three rolls, the amount of juice extracted from the cane was practically doubled over the quantity usually extracted by the old-fashioned two-roll mill generally used throughout the cane-producing sections of the country. This is of the utmost importance to economical agriculture, since it is evidently most wasteful for the farmer to produce by scientific methods and hard labor a larger crop, half of which is wasted in the process of manufacture.

(2) In addition to the great saving by extracting practically all the juice from the cane, other economies in the process of manufacture were worked out. One of the principal problems solved was that of

utilizing the bagasse—that is, the residue of the cane as it leaves the mill—for fuel. The results of the work show that the bagasse can furnish a large part and in some instances all of the fuel necessary not only to drive the mill and press the cane, but also to evaporate the juices to the condition of sirup.

TRADE WASTES.

Important studies have been made on the effect of smelter fumes on farm crops, forests, and farm animals, and the data gathered have been used by the Department of Justice in protecting agricultural interests from such injuries. In a suit brought by the State of Georgia to enjoin certain Tennessee smelters from destroying their forests, the use of this information resulted in the smelters being forced to condense the fumes. An experiment made to determine the possibility of making sulphuric acid from this waste was very successful, and the Tennessee copper companies are at the present time producing from 100 to 300 tons of sulphuric acid a day. This total output is used for making reverted phosphate and has greatly reduced the price of this fertilizer. Thus a dangerous and devastating waste product is now utilized to the mutual benefit of the smelters, the forests, and the farmers.

The scientific demonstrations of the extent of the injury caused by such trade wastes, not only to forests, but also to irrigation streams, farm crops, and animal life, has led the Department of Justice to compel the western smelters near Government land to install devices for the condensation of the fumes, to the mutual benefit of all concerned.

INSECTICIDE INVESTIGATIONS.

The chemical examination of insecticides and fungicides has been a potent factor in improving the purity of products now sold on the market. Some idea of the value of such work to the farmer is gained by consideration of the loss occasioned by the ravages of plant diseases and insects. Experts have estimated that there is a loss of 20 per cent from these two sources, which, when applied to the farm crops of 1911 valued at $5,367,000,000, would indicate a loss of about $1,000,000,000. Probably one-third of this enormous sum could be saved by the proper application of insecticides and fungicides of the requisite strength and purity. Any inferiority in the quality of these materials means the additional loss of the labor in applying them.

The early studies of this subject showed that many of the insecticides on the market were of practically no value whatever, owing to the fact that they contained little or no active ingredients. Other

insecticides which contained some active ingredients were adulterated by the addition of inert substances for the purpose of increasing the bulk to such an extent that they were of no value whatever.

As a result of the data secured by these investigations an insecticide and fungicide law was passed and approved April 26, 1910, which has greatly improved the conditions. Now it is a violation of law to ship in interstate commerce for sale any insecticide or fungicide which is adulterated or misbranded in any particular. A farmer in buying a supply to protect his crops can be reasonably sure he is getting exactly what he asks for and what he pays for. The insecticide laboratory of this bureau does a large part of the analytical work on the samples collected for the enforcement of the law. This laboratory, which conducted the investigations previous to the enactment of the law, did valuable pioneer work in developing methods for the analysis of these products. No methods of analysis had ever been worked out for many of the insecticides.

COMMERCIAL FEEDING STUFFS.

An exhaustive study of the various feeding stuffs on the market was completed in 1908, and the results published in Bulletin 108. This study furnished valuable data for the information of purchasers of feeding stuffs and for further studies of the nutritive value of the various materials used for stock foods. It also furnished information that has been of great value in the enforcement of the provisions of the Food and Drugs Act of June 30, 1906, which apply to these products. A study of the feeding value of various cereals was made and the results published in Bulletin 120. The chemical data secured from this investigation has been of value in agricultural studies of the best methods for increasing the nutritive value of various grains.

FARM PRODUCTS AND WASTES IN MANUFACTURING INDUSTRIES.

From an economical standpoint the investigations of the Bureau of Chemistry relating to the utilization of farm products for paper making, tanning, denatured alcohol manufacture, turpentine and rosin industries, and the destructive distillation of wood products are of the utmost practical importance not only to the farmer, but also to the manufacturer and to the consuming public.

PAPER AND LEATHER MAKING MATERIALS.

In no industrial enterprise is there greater opportunity for conservation than in those agricultural-chemical industries, tanning and paper making. Not only are large quantities of raw materials totally unused, but those which are consumed are not so fashioned that

articles of the highest utility are produced. National reserves are being sacrificed in the wasteful production of inferior products. American paper is beautiful in appearance, and American shoes are tastefully made, but too frequently both lack durability and utility.

These investigations have pointed out the ways in which better leather and paper may be made at less expense. It has been shown that certain operations of tanning—notably bleaching, adding foreign material, and scraping off the surface of the leather—are not only useless, so far as the quality of the leather is concerned, but are positively harmful to it, and make it cost more. It is important that these facts should be more generally known, in order that the squandering of the national reserves may be curtailed and the people protected from inferior products.

Investigations in progress have shown that it is practicable to reduce the weight or bulk of paper used in this country from 10 to 25 per cent. It has been demonstrated that lighter and thinner papers can be made that are in every way superior to those now generally used. The annual cost of paper can be reduced from $2,000,000 to $3,000,000, and the equivalent in raw materials and labor conserved.

The leather and paper laboratory is in a position to propose specifications for paper for various purposes, and to show how the cost of paper may be reduced and the quality improved. In several instances the saving on mailing charges alone has paid the extra cost of higher grade papers suggested by the leather and paper laboratory.

PRODUCTS OBTAINED BY THE DESTRUCTIVE DISTILLATION OF WOOD.

Extensive investigations have been made by the Bureau of Chemistry looking toward the recovery by distillation of turpentine from dead trees, sawdust, stumps, and other refuse of the lumber industry. Owing to the constantly widening field for the use of turpentine and the gradual reduction of the supply of gum spirits of turpentine the price has steadily increased. As a result the adulteration of turpentine has been all too common. The results of the investigations have been published in Circular 36 and in Bulletins 135 and 144.

It has been demonstrated that by utilizing the stumps, dead trees, sawdust, and other waste material of the lumber industry not only all the turpentine used in this country can be profitably produced, but that all the tar pitch, rosin spirits, rosin oils, methyl alcohol, acetate of lime, and acetone can be extracted from the same waste products. In addition there could be material left for making large quantities of ethyl alcohol, paper, oxalic acid, and other chemicals. The commercial importance of these facts together with processes of manufacture are fully set forth in Bulletin 144.

DENATURED ALCOHOL.

In 1906 Congress passed a law providing that domestic alcohol may be withdrawn from bond without the payment of an internal-revenue tax, for use in the arts and industries and for fuel, light, and power, on condition that it shall have been denatured by the admixture of some material which unfits it for use medicinally or as a beverage. In 1908 the Bureau of Chemistry began an investigation for the purpose of demonstrating the manufacture of denatured alcohol on a scale suitable for utilization by the farmer or associations of farmers. A model distillery was erected and operated. Various waste farm products were used in an experimental way to determine the manufacturing process to be used in each and to find out what wastes could be profitably used. A number of State experiment stations sent men to be instructed in the operation of the plant and in the processes of distillation, in order that they would be in a position to assist the farmers in their respective States to equip and operate distilling plants. Valuable data as to the yield of alcohol from various farm products were secured. The results of this extensive investigation have been published and will be useful in the development of the industry.

TESTING CONTRACT SUPPLIES.

On July 1, 1903, a contracts laboratory was organized in the Bureau of Chemistry for the purpose of applying chemical and physical tests to supplies furnished by contractors to this and other Government departments.

Large quantities of inferior goods have been rejected and the contractor required to furnish others of standard quality. Large quantities of supplies are tested for the Isthmian Canal Commission, the Post Office Department, the Government Printing Office, and in smaller quantities for other departments. In one instance tests made by this bureau showing that supplies below standard had been furnished by a contractor resulted in the return to the Government of $100,000 which had already been paid on one order alone.

WORK FOR OTHER DEPARTMENTS.

In addition to the testing of contract supplies, the Bureau of Chemistry tests a large number of other samples, conducts chemical investigations, and makes sanitary studies for other departments of the Government. Congress has specifically authorized this bureau to make chemical investigations for other departments when requested to do so by the heads thereof. Life preservers have been inspected at the request of the Department of Commerce and Labor to determine their

buoyancy, rate of water absorption, and the material from which they are made. Examinations have been made of samples of air, water, and fish food for the Bureau of Fisheries. Investigations have been made for the Treasury Department in reference to the classification of various goods for dutiable purposes. At the request of the Attorney General, investigations have been made of the effect of smelter fumes on vegetation. These are merely a few illustrations of a large number of investigations that have been made at the request of other departments.

DRUG INVESTIGATION.

On March 1, 1903, a drug laboratory was established in the Bureau of Chemistry for the purpose of studying chemicals and drugs. Valuable results have been secured. Extensive investigations of chemical reagents have been made with the view of securing more reliable chemicals for analytical work. Data have been collected for use in establishing standards.

The work done by the drug laboratory for the Post Office Department has been of special interest. Examinations have been made of a large number of remedies and fake cures of various kinds at the request of that department to assist in the enforcement of the law to prevent the use of the mails for fraudulent purposes. As a result of this work many worthless fakes have been denied the use of the mails.

EDUCATIONAL WORK.

The bureau has emphasized the value of educational work in conjunction with scientific investigations, endeavoring to make the data secured available for agricultural chemists and for other agricultural workers.

In connection with the denatured alcohol experimental work, described in another part of this report, a class in the art of distilling was conducted. Men from various State experiment stations were instructed in the processes of fermentation and distilling by actual experimental work in a model distillery plant, and by lectures by experts on the various phases of the work.

FOOD AND DRUGS ACT.

On June 30, 1906, the food and drugs act, commonly called the pure-food law, was passed. Since that time a large part of the activities of the Bureau of Chemistry has been directed toward the inspection and scientific work connected with the enforcement of that law.

FOOD STANDARDS.

In the appropriation bill for 1903 Congress authorized the Secretary of Agriculture "in collaboration with the Association of Official Agricultural Chemists, and such other experts as he may deem necessary, to establish standards of purity for food products and to determine what are regarded as adulterations therein." In accordance with this authority, I appointed as special agents members of the food standards committee of the Association of Official Agricultural Chemists, and the work of establishing standards was taken up. Later this authority was repealed.

ENFORCEMENT OF THE FOOD AND DRUGS ACT.

The food and drugs act became effective on January 1, 1907, and the actual work in connection with the enforcement of the law began on that date. The first step was to organize a force to handle the various phases of the work. The organization includes: (1) Inspectors who procure samples for analysis and information regarding the manufacture and sale of food and drugs; (2) chemists who analyze samples and make scientific investigations of problems relating to the composition and adulteration of food and drugs; (3) the Board of Food and Drug Inspection, whose duties are to consider all questions arising in the enforcement of the food and drugs act upon which the decision of the Secretary of Agriculture is necessary, to consider correspondence involving interpretations of the law and questions arising under the law, and to conduct hearings based upon alleged violations of the food and drugs act.

The enforcement of the law proceeds along two lines: First, products imported into the United States from foreign countries; and, second, products manufactured or sold in the District of Columbia or the Territories, introduced into interstate commerce, or exported from the United States.

In the case of imported foods and drugs no prosecutions are made. The effort of the department is confined to preventing the importation of adulterated or misbranded goods and causing their reshipment beyond the jurisdiction of the United States. This work is done through branch laboratories which are located at the leading ports of entry, where inspection is made of all food and drug products that enter the United States.

In the case of goods shipped into interstate commerce, or manufactured or sold within the District of Columbia or the Territories, the procedure of inspection is necessarily different. The inspectors visit all sections of the country to secure samples for analysis and such information as may be required by the department. The duties

of the inspectors are as follows: (1) To investigate the wholesale and retail market and obtain samples of foods and drugs shipped in interstate commerce. (2) To inspect manufacturing establishments and secure information in regard to the nature of the foods shipped in interstate commerce. (3) To investigate the manufacture and use of substances which are or may be employed for the adulteration of foods and drugs and methods of preparation which may lead to the damage or deterioration of foods and drugs, or to the use of improper materials in their manufacture. (4) To inspect foods and drugs imported at ports where branch laboratories have not been established. In addition to these duties, special investigations are frequently made by inspectors concerning important questions of sanitation and processes of manufacture.

Samples are shipped to the laboratories at Washington or to one of the 22 branch laboratories which are located at the principal ports of entry and the leading commercial centers.

When goods are found that are in violation of the law, the dealer or shipper is given an opportunity to appear before the Secretary of Agriculture, the Board of Food and Drug Inspection, or such official as may be designated, and present evidence in reference to the question at issue. If after the hearing it appears that the law has been violated, the board makes the appropriate recommendation to the Secretary of Agriculture, who certifies the fact to the proper United States attorney through the Attorney General, together with the necessary information regarding the case. It is then the duty of the district attorney to prosecute the case in the United States district courts.

The law also provides that adulterated or misbranded food or drugs sold or offered for sale in the District of Columbia or the Territories, imported, delivered for export, or introduced into interstate commerce may be seized and disposed of by destruction or sale, as the court may direct.

INVESTIGATIONS UNDER THE FOOD AND DRUGS ACT.

In addition to the chemical analysis of samples taken in the enforcement of the food and drugs act, a great deal of work has been necessary in the way of investigating manufacturing processes and trade practices in many classes of food and drug products. A considerable portion of the time of the analysts of the bureau has been devoted to research work along these lines. In the scope of this report it is only possible to refer in a general way to a few of the important studies. The investigations have two general objects in view: (1) To secure data on which to base action under the food and drugs act. (2) To show manufacturers and dealers how they can prepare, pack, and

ship their products in such manner as to increase their quality and purity and bring them up to a standard that will be in harmony with the law.

Among the important scientific investigations which have resulted in direct action under the food and drugs act may be mentioned that of the shellfish industry. In collaboration with the Oyster Packers' and Growers' Association, a number of experimental shipments were made on a commercial scale, oysters being taken from several localities of the United States and shipped by the different methods in ordinary practice. Chemical and bacteriological examinations were made of the oysters before and after shipping. Action was taken to stop practices in washing, packing, and shipping which were shown to be detrimental to the product. Extended investigations have also been made of the pollution of oyster beds from sewage, and action has been taken to prevent the shipment of oysters from such beds.

The effect of cold storage on various food products has been the subject of extended study, and many valuable data have been secured.

As a result of other investigations, seizures and prosecutions have been made of a long line of food and drug products, among which may be mentioned eggs well advanced in decomposition which are broken and sold in bulk in a frozen condition, figs, olives, and various kinds of dried fruit, and flour badly infested with insects. Coffee glazed with chrome yellow, macaroni colored with a poisonous coloring matter for the purpose of simulating the rich color given by eggs, and flour bleached by nitrogen peroxid for the purpose of simulating the white color of the patent flour from certain wheats are other examples.

The milk supply received from neighboring States has been investigated in a number of large cities, and several successful prosecutions have been maintained for the shipment in interstate commerce of milk adulterated by watering, skimming, or prepared in such insanitary surroundings that it was not suitable for consumption.

Important work has been done toward prohibiting the shipment in interstate commerce of misbranded and adulterated stock feed, mineral waters, flavoring extracts, dairy products, sugar and molasses, medicated soft drinks, vinegar, drugs, fake cures, and poisonous colors. The few illustrations suggest the many lines along which the work is directed.

CONSTRUCTIVE SCIENTIFIC FOOD WORK.

It has been found that by far the larger number of food manufacturers and dealers desire to comply fully with the law and to handle only pure and standard products. Many of them, however, owing to lack of technical knowledge or suitable equipment or ad-

verse local conditions, have experienced difficulty in reaching the high standard necessary to fully meet the requirements of the law. The pure-food board has undertaken, in a number of lines where the difficulties seemed greatest, to work out methods by which the product could be properly controlled and to demonstrate to the manufacturers how they can put on the market goods that are of the required standard. Trained experts have gone into the factories and studied the problems involved in the manufacture, the packing, the shipping, and the marketing of the products. The industries in which this work has been done have cooperated to the fullest extent with the bureau and have eagerly adopted improved methods that have been pointed out to them.

This constructive work naturally follows the police work under the law. It has been possible only to make a good beginning with our limited appropriation, but the results already attained indicate that this work can be extended with advantage to manufacturers, dealers, and consumers of food products.

Along this line an investigation of methods for preparing and shipping poultry and eggs in order to prevent deterioration is in progress. The industries concerned are bringing their problems for solution, and are offering the most hearty cooperation in furthering the work. The improved methods evolved have not only prevented losses, but have improved the quality of the product. The cooperators include not only associations of poultry dressers and merchants, but also railways, refrigerator transportation companies, and cold-storage warehousemen. The results so far attained have been most gratifying and still further improvements are expected.

Another important work along this line is being conducted in cooperation with the canning industry. A study has been made of the material to use in the manufacture of the can, and the degree of temperature and length of time that should be given in processing in order to get the best result in the finished product. An experimental factory has been erected and valuable data for improving the methods of canning have been secured.

Experts have been sent to factories to show how different food products could be put up and kept indefinitely without the use of any chemical preservatives. A study was made at Gloucester, Mass., of the cause of reddening of dried cod and other salt fish. Methods were worked out for improving the sanitary condition of the water supply and of the fish factories, which resulted in less infection and resultant spoilage.

RESULTS OF THE FOOD AND DRUGS ACT.

There has been a marked improvement in the food and drug supply of the Nation as a result of the enactment and enforcement of the

pure food and drugs law that has been of great benefit to the industries involved, as well as to the consuming public. No longer do the honest manufacturer and dealer have to compete on uneven terms with the misbranded and cheapened product of the dishonest competitor. The law prevents misbranding on the one hand and adulteration on the other. The product of low grade must be sold for what it is, and can not pass under the colors of a higher grade to the deception of the buyer and unfairness to the competitor.

As an illustration of the benefits derived from proper branding may be mentioned the use of medicines that contain cocaine, morphin, alcohol, and other habit-forming drugs.

The adulteration feature of the law protects the consumer from added injurious substances, from any manipulation that lowers the strength or quality, and from carelessness in manufacturing, packing, or shipping that results in the contamination of the product. The better element in all the industries affected have cooperated with the department in bringing about a strict enforcement of the law, and the bureau is now making preparations to still further aid the industry in solving the technical problems involved in the improvement of the products.

OFFICE OF PUBLIC ROADS.

PROGRESS IN USEFULNESS.

During the past 16 years the Office of Public Roads has grown from a small organization with an annual appropriation of $8,000 and employing 7 persons to a thoroughly developed organization with 165 permanent and temporary employees and an annual appropriation of $202,120. There is also an appropriation for the current year of $500,000, made by Congress to be expended under the direction of this department on post roads. It is provided that in order to avail themselves of this appropriation the States or localities interested shall contribute $2 for every $1 contributed by the National Government. The Department of Agriculture, through its Office of Public Roads, will thus direct the expenditure of $1,702,120 this year.

During the fiscal year 1896–97 the office directed the construction of 7 object-lesson experimental roads, while during 1911–12 there were built 31 object-lesson roads involving 400,775 square yards of surfacing. From 1897 to 1912, inclusive, 343 object-lesson and experimental roads have been constructed. It has been found that object-lesson roads built under the direction of engineers from the office are a most effective method of carrying information concerning standard construction to the various localities. The cost of construction is borne by the localities in which roads are built. The

number of roads built each year by the office from 1897 to 1912, inclusive, is as follows:

1897	7	1906	17
1898	10	1907	16
1899	4	1908	18
1900	7	1909	57
1901	14	1910	49
1902	15	1911	52
1903	8	1912	31
1904	17		
1905	21	Total	343

The activities of the office reflect, in a measure, the progress and present condition of the road movement in the United States. Sixteen years ago only four States had passed State-aid laws and established State highway departments to direct the work, viz, New Jersey, Massachusetts, Connecticut, and California. At the present time, however, the principle of State-aid has been adopted in 40 States.

The Office of Public Roads was originally the Office of Road Inquiry in the Department of Agriculture, and was established under authority of an act of Congress of March 3, 1893, with an appropriation of $10,000. It was provided by law that the Secretary of Agriculture should make inquiries in regard to systems of road management throughout the United States, make investigations in regard to the best methods of road making, prepare publications, and assist agricultural colleges and experiment stations to disseminate information concerning roads.

EXPERIMENTS IN CONSTRUCTION AND MAINTENANCE.

For the fiscal year 1912 Congress appropriated $10,000 to conduct field experiments in various methods of road construction and maintenance and to investigate various road materials and preparations. This appropriation has enabled the office to conduct a series of independent experiments along comprehensive lines.

TESTING ROAD MATERIALS.

In December, 1900, a laboratory was established in the Bureau of Chemistry for the testing of road materials. This laboratory was transferred in 1905 to the Office of Public Roads, where its present organization has been developed and perfected. From 1900 to June 1, 1912, 6,060 samples of road materials have been tested, including rock, gravel, sand, slag, clay, brick, cement, iron, steel, asphalt, oil, tar, rubber, and various other substances.

Much has been accomplished in the development of the physical tests of rock for road building, and the methods here adopted are now practically standard throughout the United States.

Research work in concrete has been productive of promising results. The properties of oil-mixed Portland cement concrete have been investigated, and indicate this material to be one of merit for damp-proofing purposes. A public patent has been granted for this material, so that any one may now use it without the payment of royalties. Measurements of the expansion and contraction of concrete while hardening, which are of value to concrete engineers, have aroused considerable interest and serve to explain certain phenomena in connection with concrete construction.

Experiments have been conducted to determine the efficiency of oils, tars, asphalt, and other preparations used for the purpose of preventing dust and preserving macadam roads under modern traffic conditions. Laboratory experiments have been accompanied by service tests and experiments in the field. The office has also conducted investigations to determine the feasibility of building sand-clay and burnt-clay roads in the Southern States and in the Mississippi Valley. Such construction has been found to be practicable for certain regions where materials are available and climatic conditions favorable.

Successful efforts are constantly made to bring about a more general use of the split-log drag in the maintenance of earth and gravel roads.

MODELS OF TYPES OF ROADS.

In order to better demonstrate the fundamental principles of road construction, the office has built a number of models of various standard types of roads and bridges and of road-building equipment, including road machines, rollers, and crushers. A set of models was first exhibited at the Alaska-Yukon Exposition. Since that exposition closed, similar exhibits have been shown in many parts of the United States through the medium of expositions and by means of exhibit trains operated by various railroad companies. The cost of making such demonstrations has been paid by the expositions or by the railroad companies interested. Lecturers and demonstrators from the office have accompanied exhibits and made them to a large degree schools in road building.

TRAINING HIGHWAY ENGINEERS.

Realizing the need for trained highway engineers, the office inaugurated a plan in the year 1905 whereby a number of graduates in engineering are appointed each year from engineering schools and colleges after competitive examinations. These men are given

a thorough training in road building, while they also render practical service to the Government. An efficient corps of highway engineers is thus prepared to carry out road building along correct lines. A number of engineers from the office are already connected with State and county highway departments in various parts of the United States, while several of them are constantly retained in the Government service.

INVESTIGATIONS.

The office has investigated the decomposition of rock powders under the action of water and discovered important facts with reference to their use as road materials. Investigations into the corrosion of iron and steel culverts and fences have also been productive of important results, and the matter of protective coatings has been extensively studied.

STANDARD SYSTEMS.

In May, 1907, the office inaugurated a project designed to introduce improved standard systems of construction, maintenance. and administration of roads into various counties throughout the United States. Under this plan experienced engineers are assigned to make thorough investigations on all phases of the road work of various counties and to prepare exhaustive reports with plans, estimates, and recommendations. This method has already resulted in the saving of thousands of dollars to the counties where such model systems have been adopted.

OFFICE EQUIPMENT.

Thorough and systematic methods of organization have been introduced into the administration of the office. Each employee is given specific duties to perform, and a careful system of reports and records is kept of work done and expenditures made on every project. The most approved system of filing is in use, and a library has been established containing a complete collection of periodicals, manuscripts, pamphlets, reports, and books on all phases of road work. This library is being added to constantly. Fifty-nine periodicals are now regularly received, of which 44 are donated.

The office has in its files 8,237 photographic negatives and about 5,000 lantern slides illustrating nearly every item of road improvement. These slides are extensively used by representatives of the office in lecture work. During the year just closed 1,135 lectures were delivered by representatives of the office, nearly all of which were illustrated with lantern slides.

From 1897 to the present time the office has issued 28 bulletins, 73 circulars, 10 farmers' bulletins, 19 Yearbook extracts, 15 annual reports, and 1 lecture syllabus; a total of 146 publications.

ECONOMIC BENEFITS OF ROAD IMPROVEMENT.

Investigations are now under way to determine the economic benefits resulting from road improvement and the particular relation of such improvement to agriculture. It is evident that when $142,000,000 constitutes the annual expenditure for road purposes in this country, improved business management in our road work is imperative. Much statistical work is therefore carried on, particularly on the subjects of mileage, cost, and financing. The method of financing road construction by bond issues is becoming very common and is receiving considerable attention from the office, with the view to giving appropriate information to those who contemplate such methods of road financing. In order that the office may be kept in close touch with road work, a collaborator is employed in each State to act as representative and corresponds monthly with the office.

MILEAGE OF ROADS.

An investigation was begun in 1904 to ascertain the mileage of improved and unimproved roads, rates of levy, and sources of revenue in every county in the United States. This work was finished in June, 1907, and shows that there were then over 2,150,000 miles of roads in the United States, of which only 7.14 per cent were improved. The expenditure in money and labor for that year amounted to nearly $80,000,000. A similar investigation begun in 1909 shows that there were, in 1909, 2,199,645 miles of public roads in the United States, of which 190,476 miles, or 8.66 per cent, were improved. Information in regard to expenditures on all the public roads in the United States was collected during the year 1911. This investigation shows that the expenditures for that year amounted to approximately $142,000,000.

CLEARING HOUSE FOR ROAD QUESTIONS.

The Office of Public Roads is alive to the present problems of highway development, and its efforts are constantly and systematically directed toward their solution. The normal development of the office during the past 16 years has placed it in such a position that it may now be called a clearing house for all road questions.

OFFICE OF EXPERIMENT STATIONS.

EXTENSIONS OF WORK.

During the last 16 years the Office of Experiment Stations, which was established primarily to represent the department in its relations with the State agricultural colleges and experiment stations, extended its field of work to include supervision of experiment sta-

tions under the direct control of the department in Alaska, Hawaii, Porto Rico, and Guam. It also undertook work having as its object the promotion of farmers' institutes and other forms of extension work, and was assigned the management of special investigations in irrigation and drainage.

PUBLICATIONS.

The publications of the office, which furnish a fair index of its activities, increased from 39 documents, containing 2,600 pages, in 1897, to 85 documents, containing 4,761 pages, in 1912.

The Experiment Station Record, which reviews the world's literature on scientific agriculture for the use of investigators in this line, in 1897 consisted of one volume of 1,210 pages, containing 1,565 abstracts. In the year ending June 30, 1912, two volumes of the Record were issued, each containing nearly 1,000 pages, and containing in the aggregate 7,800 abstracts. The Record about doubled in size in this time, and the volume of literature reviewed in it more than doubled.

In 1897 a series of popular bulletins, known as Experiment Station Work and published in the Farmers' Bulletin series of the department, was begun, to supplement the Record and disseminate the results of the more practical work of the experiment stations. Up to date there have been issued 70 numbers of this series of bulletins, containing over 600 articles on a variety of topics of interest to the practical farmer.

GROWTH OF EXPERIMENT STATIONS.

The growth and development of the experiment stations during the past 16 years is also indicative of the growth of the office during this period. In 1897 the stations employed 628 persons in the work of administration and research, while in 1911, the last year for which statistics are available, the stations employed 1,567 persons in their administrative, research, and other lines of work. Likewise in 1897 the stations had a total income of $1,129,833, of which $720,000 represented the Hatch Act, while in 1911 their total income was $3,662,425, of which $1,440,000 was received from the United States under the Hatch and Adams Acts. In other words, the employees and income of the stations more than doubled during the period named.

THE ADAMS ACT.

The Adams Act, passed in 1906, doubled the Federal appropriations to the State experiment stations and greatly increased the duties of the office in relation to the use of these funds for research work. The legality of the expenditures is so largely dependent upon the

character of the investigation that the supervision of the funds becomes in a large measure a supervision of the investigations and experiments as far as their character, original features, and continuity are concerned. Since the passage of the Adams Act this office has considered and approved over 600 projects outlined and submitted by the stations to be carried on with the fund provided by the act. Numerous questions arise as to the nature of the work and entail a large amount of correspondence to effect a settlement of the different problems. The Adams fund projects of the experiment stations represent a vast amount of original investigation, and there probably has never been an attempt to supervise research work conducted on such an extensive scale.

COOPERATION WITH STATIONS.

The experiment stations during the period under discussion have freely cooperated with this department in numerous lines of work and have been highly instrumental in carrying the benefit of the department's efforts to the different agricultural sections and to the individual farmer. Among the numerous lines of activity which have made marked progress as the result of vigorous efforts on the part of the department and the stations may be mentioned the utilization of lands hitherto unproductive on account of limited rainfall or lack of crops suited to the conditions.

One of the results of this work is the bringing under cultivation of large areas of dry lands and the making regions of deficient rainfall available for settlement. In this connection the introduction of durum wheats by this department and their distribution largely through the stations has been of great value to the Great Plains region and other sections where dry farming is practiced.

Plant-breeding work has undergone a remarkable development during the past 16 years, and in no other field has the work of the department, supplemented extensively by experiment-station effort, met with greater success. The production of improved seed corn has become the rule rather than the exception, and numerous varieties and strains of field, garden, and orchard crops have been originated and distributed. The Wisconsin station has distributed improved tobacco seed, pedigreed barleys, and pure-bred varieties of oats. The Minnesota station has bred a winter rye, hardier and producing greater yields than varieties ordinarily grown, and has originated and sent out a variety each of wheat, oats, corn, and flax, now commercially known and quite widely grown in Minnesota and the adjoining States. The South Dakota station has produced and given to the public some excellent hybrid plums, plum and sand cherry crosses, and hybrid raspberries, in addition to carrying on breeding work with hardy alfalfas and other promising forage crops for the

Northwest. These few examples are given to show the general trend and results of this work. There is not an experiment station in the United States to-day that does not pursue some line of plant breeding either for the purpose of improvement in yield and quality or of adaptation to particular conditions of soil and climate.

The beet-sugar industry of this country was built up practically during the past 16 years. The department aided this industry by the distribution, largely through the experiment stations, of tons of sugar-beet seed with a view to determining where the best beets could be produced and in what sections beet-sugar factories could be operated with profit and success.

Numerous other instances of cooperation between the department and the experiment stations, either prearranged or otherwise, could be given. The stations have followed up closely the department's work on plant introduction, hog-cholera serum vaccination, suppression of bovine tuberculosis, and other phases of work of sectional and national importance.

AGRICULTURAL EDUCATION.

In 1897 there were 61 colleges giving instruction to 4,000 students in agriculture; in 1911 the 67 State agricultural colleges enrolled almost 18,000 students in agriculture, and there were also 42 privately endowed colleges giving courses in agriculture. The total income of the land-grant colleges in 1897 was $5,000,000; in 1911, $22,000,000, and the total value of their property increased from $51,000,000 to $120,600,000.

Very few of the agricultural colleges gave opportunities for graduate study in agriculture prior to 1897, and there was no national graduate school of agriculture. Since then five sessions of the Graduate School of Agriculture have been held under the auspices of the Association of American Agricultural Colleges and Experiment Stations, and 43 of the agricultural colleges now give graduate courses in agriculture. None of the agricultural colleges trained teachers for high schools in 1897; now 40 of them do this. Then none had extension departments; last year they enrolled 169,000 students in correspondence and extension courses in agriculture.

There were 9 agricultural high schools in 1897, 78 in 1912. No public high school then taught agriculture; now 289 of them in 11 States receive State aid for courses in agriculture, home economics, and farm mechanics, Minnesota alone giving $125,000 a year for these purposes. Over 1,600 other high schools give instruction without State aid.

Agriculture in the elementary schools had hardly been thought of in 1897, whereas now nearly every State in the Union gives some encouragement to such teaching, and 19 require it by law. To pre-

pare teachers for this work 196 normal schools now give instruction in agriculture.

In 1897 the department listed 70 colleges and high schools as teaching agriculture; now the list—an incomplete one at that—includes 2,575 colleges and high schools in the United States.

Prior to 1897 the Office of Experiment Stations had no regular agricultural education service, and it had issued only about two dozen publications relating in any way to agricultural education. Since that time it has issued 123 publications, dealing with all phases of agricultural education, of which hundreds of thousands of copies have been sent to all parts of the country. It has five people giving all of their time and five others giving a part of their time to the promotion of agricultural education. For 17 years the director of the office has been a member of the committee on instruction in agriculture of the Association of American Agricultural Colleges and Experiment Stations, and for all five sessions of the Graduate School of Agriculture he has been dean of the school.

The agricultural education service of the office represents the department in its relations with agricultural colleges and schools at home and abroad, cooperates with other bureaus of the department in educational projects, and lends advice and assistance in every way possible to State and National institutions and organizations for agricultural education.

FARMERS' INSTITUTES.

The work of aiding in the development of the farmers' institutes was officially undertaken by the department in 1903 under an act of Congress of that year providing for the appointment of a farmers' institute specialist. His duties as defined by the act were "to investigate and report upon the organization and progress of farmers' institutes in the several States and Territories and upon similar organizations in foreign countries, with special suggestions of plans and methods for making such organizations more effective for the dissemination of the results of the work of the Department of Agriculture and of the experiment stations and of improved methods of agricultural practice." An institute specialist was appointed, who entered upon his duties April 1, 1903.

STATISTICS.

Prior to this appointment the Office of Experiment Stations in 1900 had collected information in regard to the status of the institute work of the country, which was published as Bulletin No. 79, and again in 1902 data were gathered and tabulated and published by the office in its annual report. According to that report institutes

were held in that year in 43 States to the number of 2,772, with an attendance of 819,995, and funds were contributed by the State legislatures for institute work to the amount of $145,650, and there was received from other sources $17,474. This was the status of the work when the department established the farmers' institute office.

The progress made since then is seen in the report of the institute specialist for the year ended June 30, 1912. During that year institutes were held in all of the States and Territories excepting Alaska, Hawaii, Nevada, and Porto Rico. The total number of meetings was 7,079, covering 9,429 days and composed of 17,760 sessions. The attendance at the regular institutes was 2,483,028, and the amount appropriated for their support was $516,072, not counting sums contributed by individuals for rent of halls, entertainment of lecturers, advertising, and other local purposes.

As an outgrowth of the general or mixed institute there have developed since 1902 the women's institute, institutes for young people, the movable school of agriculture, the instruction train, the round-up institute, the field demonstration, agricultural picnics, institute exhibits at local and State fairs, the agricultural club, and the correspondence course. Attendance upon these special forms of institute activity in 1912 was 1,476,477, making the total attendance at institutes of every kind during the year 3,959,505. The body of expert lecturers in the employ of the State directors giving instruction in the institutes now numbers over 1,100. No such school of instruction equal either in number and skill of its teachers or in the number of adults attendant upon it exists anywhere else in the world.

THE DEPARTMENT'S RELATION TO INSTITUTES.

The work has been along the lines directed in the act authorizing the employment of a specialist. Statistical data and other information respecting farmers' institutes and other forms of agricultural extension both in this country and abroad have been gathered and prepared for publication. Numerous addresses before farmers' associations and in educational institutions have been delivered. Bulletins and circulars upon agricultural extension have been prepared. The proceedings of agricultural associations and conventions have been edited and published. Officials connected with agricultural extension work in the agricultural colleges, fair associations, State libraries, railroad agricultural extension departments, State departments of agriculture, and other associations interested in agricultural extension work have been visited and interviewed. Printed information has been distributed, and the correspondence of the office has been conducted.

The institute specialist has for a number of years acted as secretary of the committee on agricultural extension work of the Association of

American Agricultural Colleges and Experiment Stations, and also as secretary-treasurer of the American Association of Farmers' Institute Workers. He has collected annually for the Association of Colleges and Stations data respecting agricultural extension and has prepared the programs and selected lecturers for the annual meeting of the Association of Farmers' Institute Workers. A large amount of travel has been performed by the institute specialist and his assistant in promoting extension work, and a great number of lectures have been delivered before meetings of agricultural people in both State and National conventions. Numerous addresses and papers have been prepared by the office for publication, and a large correspondence has been conducted. Over 20,000 names of prominent agriculturists in the United States have been listed, representing all forms of extension activity.

PUBLICATIONS.

There have been prepared and published as original matter by the Farmers' Institute Office 6 bulletins consisting of 392 pages, 15 circulars of 335 pages, 9 annual reports of 420 pages, 2 separates of 29 pages, and 1 illustrated lecture of 25 pages; a total of 1,201 pages.

There have also been edited in the office 13 bulletins, 1,909 pages; 13 illustrated lectures, 278 pages; a total of 1,368 pages. There have been prepared in the office and are now ready for publication 3 bulletins of 370 pages of manuscript, and there has been edited and sent into the editorial division 1 bulletin, 76 pages.

There have been added to extension literature by the institute office contributions along the following lines: The origin and history of farmers' institutes in the several States; the laws under which the institutes operate; information respecting agricultural education for adults in 25 foreign countries; forms of extension work for agricultural colleges and experiment stations; the names and addresses of farmers' institute directors and lecturers in the United States; form of organization and courses of study for movable schools of agriculture; forms of organization for institutes for women and for young people; reports upon transportation companies of the country as factors in agricultural education; annual report upon the farmers' institute work in the several States with suggestions for its improvement; a series of lectures upon agricultural subjects illustrated by 641 lantern slides; also reports of the proceedings of the American Association of Farmers' Institute Workers, comprising 651 pages, and containing discussions of institute problems by the leading institute directors, lecturers, and educators of the United States and Canada; a translation of the results of agricultural extension work in Belgium, together with papers, discussions, and addresses before meetings of agricultural people in both State and National conventions.

The effort has been to develop forms of extension already in operation, and to introduce new methods for use by State officials

and college-extension directors engaged in agricultural instruction work. During this period the foundation of a permanent system of farmers' institutes has been laid and direction given to the conduct of the work throughout the country.

INSULAR STATIONS.

Agricultural experiment stations were established under the supervision of the Office of Experiment Stations in Alaska in 1898, in Hawaii and Porto Rico in 1901, and in Guam in 1908, preliminary surveys having shown the apparent necessity of such investigational institutions in the different regions. The policy adopted at the beginning and maintained ever since was to determine and develop the agricultural possibilities of Alaska, to diversify the agriculture of Hawaii and Porto Rico, and to restore that of Guam to its former importance.

ALASKA.

In Alaska, on account of the size of the country and the diversity of conditions, stations have been established at various points along the coast and in the interior valleys. The principal lines of work have been agriculture, horticulture, and stock raising. At Sitka, where headquarters are maintained, horticulture has been given prominence, and not only have varieties of garden vegetables been found adapted to that region but bush fruits have been introduced and are flourishing, apples and cherries have been matured, and hybrid strawberries produced that excel in hardiness and quality any cultivated varieties that have been tested.

In the interior valleys, at Rampart and Fairbanks, grain farming is being especially studied. A majority of the varieties of barley and oats have ripened every year at Rampart since the station was established in 1900, and some varieties of wheat and rye have likewise matured. Last year practically all varieties of cereals ripened. Some hybrid barleys have been produced that for earliness excel any of the introduced ones. Siberian alfalfas have been successfully introduced and have withstood the winter climate for two years. At Fairbanks similar results have been secured, and these two stations represent a large area of land whose agricultural possibilities are by no means unimportant. Potato growing has been given attention at all the stations, and at Fairbanks field yields of over 200 bushels per acre were secured in 1911.

At the station on Kodiak Island attention has been given for about six years to stock raising, and Galloway cattle have been found perfectly adapted to the country, a herd of nearly a hundred head having been maintained almost exclusively on pasture, silage, and hay made from native grasses.

The investigations thus far conducted in Alaska have shown that a considerable amount of agriculture is possible in that country; within limits it is possible to recommend varieties of all the better known vegetables for cultivation in the different regions of the Territory, and the possibilities of cattle raising have been fully demonstrated.

HAWAII.

In Hawaii the diversification of agricultural industries has been the main problem of the station. Through its efforts a number of new industries have been established and others aided in their development. Investigations showed the possibility of tobacco growing in Hawaii, and several companies and individuals have engaged in it on a commercial scale. One company expects to plant 200 acres of tobacco in 1913.

The rapid development of the pineapple industry in Hawaii owes not a little to the station, and this crop has become second in importance among the agricultural industries of the islands, the estimated pack of canned pineapples of one of the largest companies being 360,000 cases for 1912.

The station has assisted materially in developing a rubber industry in Hawaii, and has shown the possibility of growing cotton on a commercial scale. In this work sea-island and Caravonica cotton are successfully grown as perennial crops, the plants being pruned each year to get the best results.

A very extensive study of the rice crop has been made, and new varieties of better yielding character have been bred and distributed. The method of fertilizing rice was found faulty, and instead of nitrate of soda being used at an actual loss the crop may be doubled by the use of sulphate of ammonia applied when the crop is sown. Next in efficiency is bean-cake meal. Practical methods for the propagation of choice varieties of tropical fruits have been worked out that are being put in practice not only in Hawaii but elsewhere.

The peculiarities of the Hawaiian soils are being studied, and the effects of some of the more unusual soil constituents are being tested. A considerable number of forage plants and other plants of economic importance have been introduced and are receiving wide attention. Insect pests are being studied, and methods for the control of some have been discovered.

PORTO RICO.

In Porto Rico the problems of diversification of agriculture have been about the same as in Hawaii, where sugar production is the leading industry. The station early took up the problems of citrus-fruit and pineapple production, and the exports of these fruits have

grown from less than $100,000 in 1900 to over $2,100,000 in 1911. The station has shown in growing these crops that in Porto Rico at least windbreaks are necessary for citrus fruits and that too much lime in the soil must be avoided in planting pineapples.

The renovation of coffee plantations has been given much attention with promising results, and the value of pruning, fertilizing, and cultivating the trees has been demonstrated. By following these means a renovated plantation was made to more than double the average yield of the island. New varieties of coffee have been introduced, and many of the higher priced coffees of the world are now in bearing and their seed is being distributed for planting.

Much attention is being given to insect pests and fungus diseases, and marked progress has been made in combating them. Windbreaks as conservers of moisture in citrus groves have been found an efficient means of securing conditions favorable for the development of fungi which destroy some of the most troublesome scale insects affecting oranges. A special study has been made of some of the so-called sick soils of Porto Rico, which from chemical and physical composition should be productive but which are almost wholly barren. The causes of their peculiar behavior appear to be biological, and means for their improvement are being worked out.

An effort is being made to improve the live stock of the island, and the station has introduced improved breeds of horses, cattle, swine, and poultry, and the presence of such animals is already apparent in the better grades of stock found in many localities.

GUAM.

In Guam from various causes agriculture had fallen to a very low plane and production was much below the food requirements of the island, and the immediate problem has been its improvement. The first efforts were in the securing of better varieties of crops and the introduction of new ones that have proved valuable in other tropical countries. In this the station has been very successful, and a number of forage plants, varieties of corn, vegetables of various kinds, tropical fruits, etc., have been thoroughly established.

Following the demonstration that forage could be readily produced, improved horses, cattle, swine, and poultry have been sent to Guam, and late reports state that they are doing well in their new surroundings. Only one year has elapsed since the stock was sent to Guam, but their presence has already awakened among the people a desire for better animals upon their ranches.

The work before the stations is the same as it was in the beginning—pioneering in Alaska, the diversification of agriculture in Hawaii and Porto Rico, and improving agricultural methods in Guam. Some progress has been made, but much yet remains to be

done. In nearly every locality where stations have been established the results of their work are seized upon and put into practice. The stations are heartily cooperating with the people by furnishing advice, new seeds, etc., and in turn the people are right loyally supporting the stations according to their ability to do so.

NUTRITION INVESTIGATIONS.

Sixteen years ago the nutrition investigations of the Department of Agriculture had just passed the organization period and begun the period of development which since that time has been steady and continuous. The purpose of these investigations is to study the use as food of products of farm, ranch, and garden, and to bring the results obtained to the attention of housekeepers, and thus help them in making the best, most rational, and most economical use of available resources.

A great variety of questions have been studied, and the results obtained have been of very decided value to the housekeeper, as well as to the producer of food supplies and those who manufacture, handle, and market them. As a whole the investigations have provided and made accessible a large amount of data regarding the composition and nutritive value of American food materials, their properties, and their uses. Special investigations have been numerous, as is shown by the references which follow.

DIGESTIBILITY.

The relative digestibility of bread made from different sorts of flour has been studied exhaustively, the conclusion reached being that coarse flours are somewhat less thoroughly assimilated than fine grades, but as a whole all are well digested and are very valuable foods. Similar studies have been made of the relative digestibility and nutritive value of meat of different kinds and cuts. Whatever the cut, mutton, beef, and other meats were found to be very thoroughly assimilated and valuable sources of protein and energy in the diet. Cheese has been studied exhaustively, and, judged by its thoroughness of digestion and other nutritive qualities, it is to be regarded as a staple food suitable for use in quantity rather than as an article for occasional use. Studies of the digestibility and nutritive value of cereal breakfast foods and other cereal foods, of food and food products, of nuts, and of vegetables of different sorts have also been carried on.

From these and other studies which have been made to learn the thoroughness of digestion of ordinary foods of different sorts prepared in the usual ways average figures have been deduced, with the aid of which thoroughness of digestion can be computed with reasonable accuracy—a great convenience under many circumstances.

COOKING PROCESSES.

Much time has been given to the effects of various cooking processes on nutritive value and digestibility and to the relative value of different methods of preparing food when judged by quality, palatability, and the labor involved. The results show clearly that laboratory methods can be as profitably used in the solution of such questions as they can be in milling, paper making, dyeing, and other commercial industries.

DIETARY STUDIES.

Dietary studies have been carried on in homes and in public institutions, which have furnished data of great value regarding the living conditions of the American people and have helped in the formulation of dietary standards which are used as guides in home and institution management. The studies have also furnished information of use in the selection and preparation of foods as well as in providing quantities sufficient for adequate nourishment without undue waste.

RESPIRATION CALORIMETER.

The respiration calorimeter 16 years ago was in the experimental stage. Since that time it has been perfected and so simplified that it can be operated with ease and made to furnish results of great accuracy. The uses to which it may be put in the study of food problems are very numerous and by no means exhaust the field of its usefulness. A later development of this apparatus is designed for the study of fruit ripening and other problems of vegetable life, a kind of work original with the department and full of possibilities for helping the grower, the shipper, and the handler of fruits and vegetable products, as well as the housewife who uses them. Plans involving cooperation with other bureaus of the department have been formulated which have to do with the ripening of fruits and other vegetable products and the handling and care of animal products.

Studies planned, or already in progress, have to do with the food value of mutton, the relative nutritive value and culinary qualities of different animal and vegetable fats, the use of dried fruits in the diet, the relative ease of digestion of different foods, and other similar work. In carrying out these projects the respiration calorimeter will be used.

PUBLICATIONS.

Of the 62 technical publications which have reported the results of nutrition investigations, all but 10 have appeared during the last 16 years, as have all but 3 of the 50 Farmers' Bulletins and other popular publications, which have summarized information on food topics in such a way that it might be valuable to the housewife and

the student. The demand for the technical bulletins and nutrition charts has exceeded the supply, while the demand for popular bulletins has grown very greatly, particularly during the last 10 years, and has been so large that over 12,000,000 copies of Farmers' Bulletins on bread, meat, milk, fish, eggs, and other foodstuffs, and their care, preparation, and use in the home, and a correspondingly large number of other popular nutrition documents, have been required to meet it; and the demand is still growing.

This widespread distribution of information pertaining to home problems is equivalent to an increase in the available food supply, since it makes possible a better and more economical use of available resources, and shows how needless waste and loss may be avoided.

Farmers and housekeepers have come to realize that the Department of Agriculture devotes its energies to questions which are fundamental to their interests and that it can and is ready to help them solve their problems. As a result, they turn to the department for help in increasing numbers. This is strikingly the case in all that pertains to food and nutrition. Thousands of letters are received each year from housekeepers, home makers, teachers, students, and others, and, in so far as it can be done, the desired information is supplied, either in printed documents or more directly by letter. The department has been called "the people's university," and as a disseminator of knowledge of farm and home topics it well deserves this name.

METHODS FOR STUDYING NUTRITION PROBLEMS.

The development and standardization of methods for studying nutrition problems and the devising of ways in which information that has been accumulated may be best made available to housekeepers and students have been an important part of the nutrition work. What has been accomplished in this way is applicable not only to nutrition, but also to related topics—clothing and shelter—which with nutrition make up the subject of home economics. In this work the department has done something which was recognized by agricultural experts as a public need even before the Department of Agriculture was established. It is evident that those who worked for the founding of the Department of Agriculture had in mind the desirability of studying home problems along with those of the farm, for the first report of the first commissioner of the United States Department of Agriculture, published in 1862, quotes with approval a statement made some 20 years earlier of the objects of a great national Department of Agriculture, which includes household economy as a division of agriculture in its widest acceptance, together with cultivation of the soil, orcharding, gardening, "rural embellishment, and the veterinary art." This is logical, for all food products, most

of the raw materials for clothing, and many of the materials used for shelter are supplied by agriculture, and it is as important to study their use as their production, since the two are interdependent.

The Department of Agriculture not only helps the farmer to make two blades of grass grow where one grew before, but also, through its studies of the use of agricultural products as food, helps the housekeeper in her efforts to make one dollar do the work of two in providing for the family table, so that it may meet the daily requirements for food, accord with the tastes of the family, and be reasonable in cost in proportion to the family income.

IRRIGATION INVESTIGATIONS.

Sixteen years ago the farmers of the arid region were just beginning to realize the need of more scientific and technical advice in the solution of their many irrigation problems. The crude laws of the western miner when applied to irrigation were proving a misfit. Water rights were undefined, and water users were left with little protection save through costly and long-continued litigation. Again and again State legislatures tried to grapple with this difficulty, only to find at the closing hours of each session that they did not possess reliable information on which to base remedial legislation pertaining to the use of water for irrigation and other beneficial purposes.

In 1896 water was used on about six and one-third million acres in the West, but little was known of the quantities diverted or of the large losses which occurred in conveying water through earthen ditches to so many farms.

In 1898 Congress granted a small appropriation for irrigation investigations to be used wherever advisable in cooperation with western agricultural colleges and experiment stations. The collection and publication of information pertaining to the use of water in irrigation was accordingly begun, and there can be no doubt but that the expansion and continuity of this work has exerted a marvelous effect on the development of irrigation along right lines during the past 14 years. In that time the States of Nebraska, Idaho, Utah, Nevada, North Dakota, South Dakota, Oregon, New Mexico, and Arizona have adopted modern irrigation codes based to a large degree on the recommendations of this department. In all of the States named, including Colorado and Wyoming, the chaotic state of affairs regarding irrigation which prevailed 16 years ago is giving place to law, order, and system. The water records are being cleared of worthless claims, and valid rights are not only recognized but protected.

DISSEMINATION OF INFORMATION.

As conclusions of value were arrived at in regard to the use of irrigation water they were set forth in bulletins which were disseminated throughout the West. The results of these investigations have been

watched closely, and it is believed that they have caused a much better understanding among irrigators of the best methods of applying water, the dangers of waste, and the actual requirements of irrigated crops. As an instance of the reform that has been accomplished in this line, the changes that have been brought about in the use of water in the Modesto irrigation district in California may be cited. In 1904 diversions by the Modesto Canal amounted to more than 13 acre-feet per acre for the land irrigated. In 1912 slightly more than 4 acre-feet per acre were used.

As the work of the investigations became better known frequent requests were made by prospective settlers in irrigated sections for information concerning the possibilities of irrigation in various Western States. To meet this demand a series of bulletins was published providing in concise form such information concerning conditions in each State as was believed to be of value to prospective settlers on irrigated lands. To meet a similar demand which came largely from farmers already irrigating, other bulletins were prepared giving advice as to the best methods and practices employed in the irrigation of crops most widely grown in the West.

Contrasting the small beginnings of irrigation investigations of this department 14 years ago with the present, one finds that the congressional appropriation has increased tenfold and that the work actually undertaken has increased in even greater ratio. The six and one-third million acres which were irrigated under private enterprises in 1896 have increased to 15,000,000 acres, and instead of being confined to the more arid portions of the country it is rapidly extending to practically every State of the Union regardless of the annual precipitation. In Louisiana, Mississippi, and southern Arkansas the rainfall frequently exceeds 50 inches per annum, yet a most remarkable development has taken place in this district in the past 16 years as the direct result of irrigation. In 1911 over 700,000 acres were seeded to rice, all of which were irrigated. This extensive acreage produced in that year over 22,500,000 bushels of rice, for which the growers received over $18,000,000. Ten years ago prairie lands in Arkansas were held and occasionally sold at $5 to $6 per acre. Now the pumping of water from wells and the profitable production of rice under irrigation has increased the price to from $50 to $90 per acre.

From the irrigated rice fields of the Gulf States the practice of irrigation has extended eastward throughout the humid region. The department is now carrying on successful cooperative experiments in the States of Alabama, Florida, Georgia, New Jersey, Maryland, Iowa, Minnesota, and Wisconsin. While the data thus far secured are incomplete they are sufficient to indicate that eventually all high-

priced and intensively cultivated crops throughout the humid region will be insured against drought by supplemental irrigation.

DRAINAGE INVESTIGATIONS.

The drainage investigations of the Department of Agriculture are destined to play no mean part in the development and conservation of our natural resources. There are in the United States approximately 79,000,000 acres of land, exclusive of tidal marshes, that can not be profitably cultivated on account of excess moisture. It has been estimated that this area, comprising 52,665,000 acres continually wet, 6,826,000 acres of wet grazing land, 14,748,000 acres periodically overflowed, and 4,766,000 acres of farm land periodically swampy, could be drained at a net profit of $1,594,000,000, measured by increased land values, with an increase of annual income estimated at $273,000,000. Western irrigated lands that but recently yielded grain and fruit abundantly have been abandoned, having become swampy or incrusted with alkali. The area affected, already great, is enlarging every year as irrigation continues. The lack of natural drainage is requiring that artificial means be provided for removing the excess water and preventing a large part of the lands under irrigation from being rendered worthless.

SCOPE.

Previous to 1902 the department gave no special attention to land drainage. Now the investigations embrace a study of the requirements of drainage in various localities and under differing conditions; the collection of technical data of service to engineers and others having to do with the design of drainage improvements; and the rendering of assistance by correspondence to owners of land needing drainage, by personal consultation and occasionally by surveys with reports presenting detailed plans for the requisite improvements. The construction work, however, is done by the landowners to be benefited. Investigations have been conducted in nearly every State. The total area surveyed is approximately 8,800,000 acres, classified as follows: Subject to periodical overflow, 4,110,000 acres; continually wet, 3,550,000 acres; requiring new or improved outlet channels, 760,000 acres; farm lands needing complete drainage, 20,000 acres; irrigated lands, 360,000 acres.

RESULTS.

As the result of the department's work there has developed a very active interest in the drainage of the swamps and other wet lands of the coastal plain, from Maryland to Texas. Drainage engineers of the Office of Experiment Stations have examined a large part of those areas, preparing plans for more than half a million acres.

Tracts of the fertile wet prairie lands of the Louisiana gulf coast are being surrounded by embankments and drained by means of pumps. This development will ultimately involve problems equal to those of reclaiming the lowlands in England and Holland.

Communities embracing large overflowed areas in the Missouri and Mississippi Valleys are organizing and constructing drainage improvements. The levees along the lower Mississippi River have in some measure complicated the drainage problems there, as they make it necessary to divert waters from their natural channels and discharge them at considerable distances farther down the valley. No little judgment is required to devise drainage systems that will be economical and efficient, at the same time subdividing the natural drainage units into such parts that the necessary cooperation of the landowners can be secured to complete the work of reclamation.

SEEPAGE AND ALKALI.

The injury to irrigated lands from seepage and alkali has undoubtedly been hastened in many instances by the unnecessarily lavish use of water, but except where soil conditions are unusual, the same effects, in a modified degree, will follow sooner or later even with the greatest economy of irrigation. Not all the water applied can be retained in the root zone of the plants; the balance percolates downward until checked by some impervious stratum, accumulating until the plane of saturation is raised sufficiently to render the ground surface swampy in the lower places.

Injurious salts in solution may be carried to the surface by capillarity, and there deposited as the water is evaporated, even when the ground is not saturated to the surface. The investigations have determined that while methods of drainage used in the humid sections are often valueless in the irrigation region, seeped lands can be reclaimed by drains properly designed and installed. The drains are usually laid at considerable depth to intercept the underflow from higher lands. Relief wells may be below the drains to offer the water an easy passage upward from a loose underlying stratum, rather than above the drain to admit surface water. Each irrigated tract requires a study of subsurface soil and water conditions, such as is not considered in drainage east of the one-hundredth meridian.

COLLECTION OF TECHNICAL DATA.

The collection of technical data is an important part of the drainage investigations. This includes determining the quantity of water to be removed and how it is affected by rainfall, topography, soil, vegetation, and size of watershed area; the capacity of drainage channels under various conditions of smoothness and of uniformity of cross section; the special requirements for draining muck and peat soils;

the conservation of soil on hillsides; and the proper depth, spacing, and arrangement of open ditches and tile drains for the various kinds of soils. In the irrigated region special study is made of the movement of ground water and of the effectiveness of drainage in removing alkali. While definite quantitative results in some of these lines must wait upon further investigations, the data already obtained have enabled invaluable advice to be given with respect to particular projects.

LIBRARY.

LARGEST COLLECTION OF AGRICULTURAL LITERATURE.

The growth of the library during the past 16 years has more than equaled its growth during the previous 34 years of its existence. In 1897 it contained approximately 59,000 books and pamphlets, while to-day its collections number 122,000 books and pamphlets. The library at the present time contains the largest collection of literature in this country on agriculture and related sciences, and as far as known is the largest agricultural library in any country.

In the subject of American agriculture, including horticulture, forestry, pomology, dairying, live stock, poultry, agricultural statistics, and the various agricultural crops, it is especially complete. In addition, it has a large and representative collection of the most important foreign agricultural books and periodicals and a collection of the publications of foreign agricultural institutions, societies, and experiment stations, which is without question the largest and most complete in the United States. In the sciences that relate to agriculture, such as botany, chemistry, and zoology, the library's resources compare favorably with the resources of the large college and reference libraries of the country in these subjects, and along economic lines are probably unsurpassed.

It is especially strong in scientific and technical periodicals and society publications. Nearly 2,000 periodicals are being received currently, of which number a little less than two-thirds are sent as gifts and exchanges.

CATALOGUES.

Since 1897 the appropriation for the library has been increased from $13,960 to $40,500, and the staff has grown from 6 to 29. There has been a corresponding increase in the activities and usefulness of the library. Only a comparatively small portion of the library was catalogued in 1897; to-day the dictionary card catalogue, containing approximately 286,000 cards, includes entries for nearly all the books in the library and is an invaluable key to the literature of agriculture and the related sciences. In 1899 the issuance of a card catalogue of the publications of the department was begun by the

library. It was, as far as known, the first attempt on the part of any institution to furnish to the outside world a complete printed card catalogue of its publications. The service in printed cards was still further increased in 1902, when the printing by the Library of Congress of the catalogue cards for accessions to this library was begun, the library of the department being the first of the department libraries to cooperate in this way with the Library of Congress.

In addition to issuing these printed cards, the library has made its resources better known by printing separate catalogues of publications relating to botany, forestry, irrigation, and entomology, and lists of its periodicals. It has also published regularly a bulletin of its accessions.

In 1897 the library occupied the large room on the second floor of the main building into which it had been moved 10 years previously, and it continued to occupy this room until 1908, when, on the completion of the new laboratory buildings, it was moved to the ground floor of the east wing. The rooms being designed for laboratories are not well fitted for library use, but it is a matter for congratulation that the library is now stored in a fireproof building, as it would mean an almost irreparable loss to the department if the library's collections were destroyed.

INCREASING USE OF LIBRARY.

With the growth of the department in the past 16 years the use of the library has increased more than 500 per cent. Its usefulness to the State agricultural colleges and experiment stations has also been greatly extended. Whereas only an occasional book was formerly borrowed by an agricultural college or experiment-station worker, during the past year 620 books were lent to workers in 39 different States and Territories, in range from Maine to Hawaii and from Oregon to Florida and Porto Rico. By increasing and perfecting the library's collections, in order that it may more fully meet the demands made upon it and by making its collections and services widely useful, the library is from year to year performing more and more the duties of a national library of agriculture.

FOREST SERVICE.

PREVIOUS ORGANIZED ACTION.

Forestry in the United States at the beginning of 1897 was still in its dark ages. Its general practice seemed about as imminent as when Columbus first set foot upon the shores of a new world. A few far-sighted and public-spirited men had tried from time to time to arouse realization of the danger that lay ahead if wasteful destruction of a great primary resource were not checked; but they

were as voices crying in the wilderness. Their warnings were, on the whole, rather less productive of results than had been similar warnings in colonial days.

Unquestionably one reason why predictions of direful consequences in store if waste were not curtailed aroused little interest was the fact that the cry of "wolf" was so old. The history not merely of agitation but of legislation with regard to forests reaches back into the early days of settlement along the Atlantic coast. Laws for the care and protection of forests were placed upon the statute books of several of the Colonies.

Late in the eighteenth and early in the nineteenth century agricultural societies in Massachusetts and New York acted on behalf of forest protection and promotion of the growth of forests. Between 1799 and 1831 Congress legislated again and again with a view to insuring the maintenance of supplies of live oak. In 1867 horticultural and agricultural societies in Wisconsin appointed a committee to report on the results of forest destruction. Laws for the encouragement of tree planting were passed between 1868 and 1874 in nine Western and two Eastern States. In 1869 the board of agriculture of the State of Maine took action toward the formulation of a forest policy. Arbor Day was instituted in 1872. In 1873 Congress passed the first timber-culture act. The American Association for the Advancement of Science appointed in the same year a committee to memorialize Congress and State legislatures upon the importance of promoting the cultivation of timber and the preservation of forests. The American Forestry Association was founded in 1872 and the Pennsylvania Forestry Association in 1876. The latter year marked the inauguration of forest work by the Department of Agriculture.

These are scattered examples of organized action to meet either a recognized or a supposed danger. That forest destruction was proceeding apace and threatened serious consequences had been the declaration of some observers from early days down. Those who govern their course by rule of thumb instead of by a careful analysis of conditions, and therefore hold that only what has happened will happen, were inclined to be more than skeptical concerning the existence of this particular wolf. The alarm had been raised too often. Cassandra prophecies of the approach of a timber shortage were generally received with tolerant incredulity when they did not call forth outspoken contempt.

FEAR OF WOOD FAMINE IS RECENT.

The opinion was still commonly advanced that the forests of the country were inexhaustible. Practical men who had had sufficient opportunities of observation to know the contrary were content in

the thought that the supply would last their time. Such an attitude was the more readily justified by the fact that no matter what convictions were held on the subject there appeared to be nothing in particular that anybody could do about it. Economic conditions were thought not ripe for a change. Wasteful exploitation must run its course, it was argued, and a great national asset continue to vanish in smoke until the price of protection became worth while and until the market value of a tree made growing it good business.

It may fairly be said that half a generation ago the fear of a wood famine was a matter that had not entered the field of vision of the average man. Some sagacious ones, it is true, were giving practical but unostentatious evidence of their capacity to see ahead by gathering into their ownership all the cheap timberlands that they could acquire. Thus were laid the foundations of great fortunes. Timber reservations by no means began with the Government. The proceeds of lumbering in the virgin forests of the Northeast and in the matchless Lake State pineries, once Government owned, were often reinvested in southern yellow-pine lands or in the cream of western timber. This, however, was foresight exercised for private ends. Those who put their money into such investments counted—and with reason—on diminishing supplies to force up the value of their holdings. But those who urged the necessity of public action to provide for future public needs were thought to be disturbing themselves unduly in matters which were proper subjects for the attention of Providence rather than of men. To concern oneself overmuch lest wasteful use of the resources placed at human disposal might leave posterity with nothing to use argued a lack of confidence in the Divine wisdom which had put us in a world designed for the satisfaction of all essential needs. If the forests should ever fail, there would be something better to take their place.

This optimistic point of view was fostered by the very circumstances which in reality gave greatest cause for apprehension. Unexpected and momentous changes had revolutionized the conditions on which had been predicated the early forecasts of approaching need. While by falsifying these forecasts they had operated to lull the public mind into a feeling of unjustified security, they had actually created a situation a hundredfold more serious than before. In the eighteenth and early nineteenth centuries the question of forest supplies was purely local. Transportation except by water for any great distance was out of the question for so bulky a commodity.

AWAKENING TO THE PROBLEM.

With the development of railroads affairs took on a wholly new aspect. Continental supplies were substituted for local. In the mid century the forests about the Great Lakes began to melt away,

going east, west, and south, to rise again in the countless homes of an expanding nation. From open prairie to seaboard cities, from the factory towns and hamlets of New England to the growing commercial centers and the multiplying crossroad villages of the Middle West, they fed prosperity, and fireswept desolation blotted the land of their origin.

Thus was created a problem which is now not nation wide, but world-wide. New York bids against South America and the Orient for the timber of the Pacific Northwest. Southern pine goes by water from the Gulf to Great Britain or the North Atlantic States; by rail, to meet the output of Montana's forests on the plains. In 1911 the United States exported domestic forest products to a total value of over $100,000,000, of which Europe took over $55,000,000 worth and South America about $25,000,000 worth. All the countries of eastern Europe must import timber to meet the excess of their needs over the home supply. Meanwhile, with an estimated home consumption of 23 billion cubic feet of wood annually, our depleted and abused forests are producing by growth probably less than 7 billion feet. The Bureau of Corporations of the Department of Commerce and Labor estimates the existing supply of saw timber in the United States at less than 3,000 billion board feet, which is equivalent to about 500 billion cubic feet. Economists now recognize that, taking the world over, wood consumption exceeds its growth, and that a crisis approaches.

That some measure of public provision has been made for maintained supplies of a great public necessity; that we are not merely 16 years nearer the time when wood shortage will handicap building, mining, and manufacturing, the railroad, the merchant, the farmer, the wage earner, and the consumer; that one-fifth of the standing timber in the United States is not only held and protected in national forests, but also open to use under methods which will mean increasing production through growth and successive harvests for all time; that the public is fully awake to the importance of preventing forest fires everywhere, and of substituting forest management for forest exploitation; that private owners recognize in forestry not an impracticable counsel of perfection and a fad of theorists but a tangible business proposal; that lumbermen show a growing realization of the fact that their industry is one affected with a public interest, and therefore involving a public responsibility; that immense gains have been made in reduction of waste and increased length and amount of service obtainable from what is cut; that conservation of natural resources has become an accepted public policy and a clearly perceived matter of national welfare—all these are results primarily and directly due to the work of this department within the last 10 years.

Solely to that work is due the fact not only that the great bulk of the national forests were ever set aside, but also that the justifiable demand for the supply of immediate needs has not been confronted by a flat taboo upon use which would have meant the abandonment of reservations already made. Solely to that work, again, is due the fact that the practice of technical forestry in the United States has been made possible by the gathering through the years of the basic scientific knowledge on which alone good practice can be founded. Had this great work not come when it did, most of our remaining publicly owned forests would have passed forever from public possession and private monopoly would now be forging its fetters with no prospect of relief save by the slow and difficult procedure of legislation in the face of vested rights. In 1905 I wrote:

> Seven years ago there were in the whole United States less than 10 professional foresters. Neither a science nor a literature of American forestry was in existence, nor could an education in the subject be obtained in this country. Systematic forestry was in operation on the estate of a single owner, honorably desirous of furnishing an object lesson in an unknown field. Lumbermen and forest owners were skeptical of the success of forest management, and largely hostile to its introduction. Among the public at large a feeling in favor of forest preservation, largely on sentimental grounds, was fairly widespread, but almost wholly misinformed. It confounded use with destruction, shade-tree planting with forestry.
>
> The real need of forestry was urgent. A time had come which presented at once a great opportunity and a dangerous crisis. Forest destruction had reached a point where sagacious men—most of all, sagacious lumbermen—could plainly discern the not distant end. The lumber industry, vital to the Nation at large, was rushing to its own extinction, yet with no avenue of escape apparent until forest management for future crops should be forced by famine prices. Meanwhile, however, the ruin would have been wrought already.
>
> Timberland owners were selling their holdings or their stumpage with little evidence of an understanding of their future values, and lumbermen were compelled by business competition to keep down the cost of operation to the lowest terms or market their product at a loss. Forestry was both an evident economic need and an apparent economic impossibility. Few well-informed persons believed that the obstacles to its introduction could be overcome sufficiently to bring it into common practice among private owners during the lives of the present generation. That the whole situation is profoundly altered is directly and chiefly due to the work of the Forest Service.
>
> Forestry is a matter of immediate interest to every household in the land. Forest destruction is no imaginary danger of a distant future. If it is not speedily checked, its effect will sooner or later be felt in every industry and every home. To make these facts known is a national duty. The work of education must continue until public opinion will not tolerate heedless waste or injudicious laws.

These words are no less true now than when they were written, except for the fact that the record of progress has been materially enlarged. In retrospect one central fact stands out—that the key to the whole situation was seized when the practice of forest conservation was shown to involve not the rearing of blind barriers

against the utilization of resources, but the development of resources through wisely regulated use. For passive prohibitions were substituted constructive activities.

USE OF NATIONAL FOREST RESOURCES.

The era of mere reservation culminated when President Cleveland, at the close of his administration, more than doubled in a day the total area covered by withdrawals under the act of March 3, 1891. That act empowered the President to set apart "public lands wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations." With the Cleveland additions the forest reserves totaled, on the 4th of March, 1897, not quite 40,000,000 acres.

For use of these forests no provision whatever had been made. The land was theoretically closed to all human occupation or enjoyment. In consequence an outburst of indignant protest from the West demanded that the newly created reserves should be restored to the public domain. Instead, the proclamations were suspended for a year and the act of June 4, 1897, passed. By authorizing regulated use of all national forest resources this act laid one of the two main foundations on which rests the present system of administering the forests. The second and no less necessary foundation was provided by the work inaugurated in this department one year later.

LACK OF KNOWLEDGE IN 1897.

It is difficult to realize in 1912 how completely lacking in 1897 was the knowledge necessary for the application of forestry in the United States. Almost no field studies of consequence had ever been made. The Division of Forestry, as it existed in my department when I took office, employed all told 13 persons, of whom 5 were clerks and 1 a messenger. It was a bureau of information and advice merely. It had no field equipment. It was supported by an annual appropriation of $28,520. How its work was regarded may be judged by the fact that Congress, in making this appropriation for the year 1899, attached a provision that the Secretary of Agriculture should make at the beginning of the following session a special and detailed report "upon the forestry investigations and work of the Department of Agriculture, showing the results obtained and the practical utility of the investigations."

SUBSEQUENT POLICY.

Early in the fiscal year 1913 the Forest Service employed a total of 4,097 persons. Its appropriation for the current year is over $5,000,000. Its field of work is the entire United States. Its administrative and protective duties alone (including cooperation with

States in the protection from fire of lands on the watersheds of navigable streams) are discharged in 34 States of the Union and in Alaska. The printed results of its investigations are among the publications sold in largest numbers by the superintendent of public documents, while the Department of Agriculture printed for distribution without charge, between July 1, 1897, and June 30, 1912, a total of 12,601,450 copies of Forest Service publications.

In mere size, therefore, as indicated by expenditures, the Division of Forestry of 1897 compares with the Forest Service of 1913 in about the ratio of 1 to 200, and as indicated by personnel in the ratio of 1 to 372. An announcement in the annual report of the division for the fiscal year 1897 formed the point of departure for this great expansion. A radical change in the character of the work planned was then made. This change may be put in a word: The field of activities was shifted from the desk to the woods.

Private owners of woodlands were offered an opportunity to obtain practical advice and assistance looking toward the introduction of forest management on their holdings. The response was immediate, and swiftly swelled. The area for which such advice had been asked by the close of the fiscal year 1898 was nearly 1,000,000 acres; of 1900, nearly 2,500,000 acres; of 1905, nearly 11,000,000 acres. Examinations actually made had, in 1905, covered about 4,000,000 acres. Eight years of work had fairly launched the forest movement.

The offer of advice to forest owners had for its ends investigation, demonstration, and education. Forest management is first of all a matter of practice, just as is the management of a farm. Both farmer and forester must base their practice on knowledge, and to that end knowledge must be gathered. Nevertheless, the final object is not to learn, but to do. In order to advise and assist owners who were contemplating forest management, the Division of Forestry had first to create a body of knowledge on which to base both plans of procedure having definite objects in view and estimates of the yield which might be expected under these plans; and, further, it had to devise practicable methods for carrying out these plans and to calculate what carrying them out would cost. In other words, it had to create a science, develop a technique, and work out business conclusions all at once. It succeeded because the fact was firmly grasped that the forester must not be primarily a scientist, but a director of operations. As capacity along this line was developed it was proposed to demonstrate to individual private owners how to make forestry pay, and thus to secure educational examples which other owners might follow.

As it proved, the greatest result gained was the gathering and training of a corps of technical foresters qualified by the character of their experience to assume charge of the management of the national for-

ests. The date on which, early in 1905, administrative jurisdiction over the forests was transferred to me divides the 16 years, 1897–1913, into two eight-year periods, of which the first was that predominantly of investigations, preparation, and public education, and the second predominantly of administrative activities. Yet entirely apart from the fact that the work of the earlier period made public forestry possible in the United States, it yielded results of enormous value in actual improvement of lumbering methods and widespread introduction of forest protection.

At the close of the nineteenth century lumbermen everywhere in the United States were operating with a disregard of waste inherited from days of more abundant supplies and lower prices. Stumps were cut high, marketable saw timber was left in tops, and merchantable logs were left in the woods. Further, the value of young growth not yet merchantable and the money sacrifice involved in cutting small-sized timber which, if left for a later cutting, would make rapid increase in size and value, were almost unrecognized. The first fruits of cooperation between the foresters of this department and private owners who sought their advice were accurate computations of what was to all intents and purposes money thrown away, that startled into instant attention practical woodsmen who had previously considered themselves abundantly familiar with their own business. The mere saving of unnecessary waste in lumbering was, indeed, not forestry; but the demonstration that it afforded a neglected opportunity for profit was both a material gain for forest conservation and an open sesame for the forester standing without the door of a great established industry whose practices he sought to revolutionize.

From the north woods of New York and New England to Texas and into the far West swept the new gospel of closer utilization. With or close behind it went the turning of attention to the value of immature timber in the present stand. Operators began to reckon on returning for a second and even a third cutting. Such a policy involved of necessity consideration of the fire risk. Agitation for organized fire protection by States began. The number of private owners of timberland in large holdings who have entered definitely on the policy of permanent wood production is as yet infinitesimal, but the number of those who have adopted some substitute for the old policy of immediate devastation and indifference to what may follow is very large. This in itself is a result of the utmost importance from the standpoint of the public welfare. To it the work of the division and later the Bureau of Forestry, now become the Forest Service, directly led.

Prior to 1897 the only State in which the forest question had received any material recognition was New York, which had established State reservations in the Adirondack and Catskill Mountains

and had inaugurated a system of fire protection for them, but along lines incapable of yielding effective results. In May, 1897, Pennsylvania enacted the law under which a policy of forest reservations was inaugurated for that State. Unlike New York, Pennsylvania did not adopt restrictions which closed these reservations against any actual practice of forestry upon them, but it had neither field work nor field force. There was no professional forester in the employ of any State in the Union. There are now 20 such State foresters. Thirty-three States have enacted laws shaped in the light of the knowledge made available by the work of the Department of Agriculture. Thirty-one States have sought and received the assistance of the department in the study of their forest problems. The entire movement for State forestry is the outgrowth of the work done by this department in the last 16 years, with the single exception of the movement in the State of Pennsylvania; and even there, though independently and ably led, most of the progress made could hardly have come about had there been no national movement to help it along.

Hand in hand with the creation of the science and development of the practice of American forestry, the awakening of the country at large to the issues involved and the crystallizing of sentiment into definitely formulated public policy, went the promotion of more economical use of the material drawn from our forests. To make what we have go further was equivalent to an augmentation of the supply. Study of the whole problem of utilization was pressed into varied fields.

PRESERVATIVE TREATMENT OF WOOD.

The preservative treatment of wood against decay was in 1897 practically unknown in the United States. Investigations to show what would be the money gain to the railroads through lowered costs of maintenance if ties were treated to prolong their life, and what form of treatment would prove most advantageous, were begun in 1903. To-day one-fourth of the ties used in the United States are given treatment and the number treated increases yearly, while another large fraction gain greater durability through recognition of the value of proper seasoning, as developed by our investigations. Methods of preservative treatment suitable for the use of farmers, whose fence post needs create in the aggregate an immense demand for material, have been devised. Telephone and telegraph companies are beginning to treat their poles and mine operators their timbers. This is but a single example of the way in which economies have been made possible. One or two others may be briefly mentioned; but an exhaustive list even of the leading achievements in this general field can not be entered upon here.

TURPENTINE.

In 1902 a method was devised whereby it has become possible to secure a materially larger yield and better quality of crude turpentine, with indefinite prolongation of the formerly brief period of years during which the crude material of the naval-stores industry could be gathered from the same trees. Commercial operations on the Florida National Forest have demonstrated that the naval-stores industry may be perpetuated, instead of being destroyed through the wasteful methods which have removed the industry from the Carolinas where it started. At the same time a vast new field of future naval supplies has been indicated through experiments conducted on national forests in Arizona, California, and Colorado, which have shown that western yellow pine may be utilized to supplement the pine forests of the Southeast as producers of turpentine and rosin.

STRENGTH OF TIMBERS.

Another great gain has been made through better knowledge of the strength of the various kinds of timbers used in construction and of the physical properties which determine the use to which woods may be put. While some strength tests of timbers had been made prior to 1897, the results had little applicability to construction work. Since 1902 systematic and exhaustive study of this subject has been under way, covering practically all native species of commercial importance. Tests on the woods themselves and upon wood products have led to utilization of various species formerly disregarded and to large economies in consumption.

NEW WOODS FOR PULP.

From 1897 to 1913 the consumption of wood for pulp quadrupled. At the beginning of this period three-fourths of all the pulp was spruce, and less than one-fourth of it was imported. Now, with an annual consumption of about 5,000,000,000 cords, 40 per cent is spruce, and about half is imported. In this period the price of spruce doubled. Exports of wood pulp have fallen off and imports have increased fourfold. These figures point to the fact that if the United States is to furnish its own supply of wood pulp it must do so from substitutes for spruce. Tests made by the department show that pulps of commercial value suitable for news and wrapping paper can be made by the sulphite process from eight native woods, several of which grow in quantity on the national forests. Some of these woods are beginning to be used to a limited extent. The department's activities also have proved that native species, large quantities of which are available and cheap in the Lake States, can be substituted for spruce in the ground-wood process for news print

paper. As a direct result of these experiments several mills have begun grinding these woods. Moreover, the department has demonstrated in its paper laboratories, which work under conditions comparable with those of practical manufacturing plants, that efficiency in pulp making can be raised far beyond that which obtains in the ordinary plant.

WOOD DISTILLATION.

In wood distillation the department has demonstrated that commercial yields of acetate of lime and wood alcohol can be obtained from various new woods and from mill waste of these woods. It has also demonstrated that a yield of acetate of lime more than one-half greater than the present can be obtained. There is now being installed in the forest-products laboratory a still of special design, contrived by our investigators for the production of ethyl alcohol from wood waste. Only the methyl or wood alcohols are now so produced. There is wasted in the United States each year 6,000,000 tons of slabs, edgings, and sawdust, each ton of which is capable of yielding 15 gallons of alcohol, if the proper commercial process can be developed.

KILN-DRYING.

In the artificial seasoning, or kiln-drying, of lumber, lack of scientific knowledge of what is involved and of accurate control of the methods used has been a cause of heavy loss. The average amount of material rendered unfit for use in kiln-drying is 3 per cent for softwoods and 10 per cent for hardwoods, which means a money loss of millions of dollars annually. After years of study the department has arrived at such a knowledge of the theory and practice of drying lumber as makes possible a dry kiln in which temperature, circulation, and humidity of the air are under control of the operator. This solves the fundamental problem.

FOREST RESOURCES.

When the twentieth century opened the actual situation with regard to forest supplies was a matter of entire uncertainty. The census had published figures of lumber production at successive 10-year intervals, but there was no knowledge of what supplies the country possessed or of the rate at which those supplies were replenished by growth. In 1907 the Forest Service brought together from all existing sources of information its first estimate of our actual forest resources. This stock taking was carried further in the reports prepared for the Conservation Commission. These figures, combined with the figures of annual consumption, collection of which began in 1905, showed for the first time to all the danger of an impending timber shortage.

FOREST PRODUCTS LABORATORY.

The major part of the investigative work to promote better use of what our forests furnish is now conducted at the forest-products laboratory which has been developed at Madison, Wis. The facilities for scientific research provided by this laboratory are unexcelled in any country, and the building up of this instrument of research is in itself an achievement of no mean importance. Results are being attained which mean a lessened drain upon our forest supplies through more economical use of material, the opening of new sources of supply for various industries, the utilization of every kind of wood for the purpose to which its intrinsic qualities best adapt it, a greater incentive to the practice of forestry because of the increased returns made possible, better adjustment of wood-using industries to meet the conditions created by past use without forethought, and a general clarifying of the situation with respect to our forest resources and requirements through accurate knowledge of what these requirements are and what is available to fill them.

PROBLEMS OF MANAGEMENT.

But by far the greatest achievement of the 16 years in forestry has been the working out of the national forest policy provided for by the act of June 4, 1897. This achievement is, indeed, one of the notable events in the recent history of the country. It may fairly be expected to remain an enduring milestone of progress and a matter of permanent importance. Without mention of it, no future account of the first decade of the twentieth century will be complete.

The act of June 4, 1897, conferred upon the Secretary of the Interior every authority and power necessary for managing the national forests in accordance with the principles of practical forestry. Funds for this purpose were first made available for the fiscal year 1899. An administrative force, consisting of superintendents, supervisors, and rangers, was thereupon organized. It shortly became apparent, however, that the task of opening the forests to wise use and of developing their resources effectively was one for which the department then in charge was not well equipped. Accomplishment of this task demanded not only authority in law but also technical knowledge constructively applied. In so far as there existed at that time any technical knowledge at all of the principles of forest management, it was in the small but energetically working and rapidly growing Division of Forestry in this department. The result was that on December 7, 1899, the Secretary of the Interior made a request upon me for technical advice regarding the management of the forests.

During the next five years such advice was given, to the extent of the resources available. Field parties were sent out to study the forest conditions and gather the data necessary for the preparation of plans of management. The fundamental problem was to know how use might be so regulated as to insure perpetuation and even improvement of the resources concerned, along with the largest immediate returns consistent with permanence. There were recognized three major resources to be both used and safeguarded—timber, water, and range.

The most immediately urgent part of the problem was, on the whole, that relating to the range. Because of the harm done both to forest growth and to water flows by overgrazing, all these resources were to some extent at stake; grazing could not be dealt with as a matter of forage production solely. From the nature of the range-stock industry and because of the general economic conditions which existed throughout most of the West, it had come about that while the demand for national-forest timber was exceedingly restricted and almost entirely local, the forage crop was almost everywhere in great demand. Sheep and cattle competed with each other for the summer feed found in the forest-clad mountains, and rival sheepmen and cattlemen competed among themselves. Much of the range had become so overcrowded as to cause serious impairment of its carrying capacity, and the evil was thus accentuated. Progressive deterioration threatened to wipe out both the forage resource and most of the stock industry dependent upon it. Hand in hand with range depletion went damage to water supplies, inflicting hardships upon settlers in the valleys and imperiling the welfare of great regions. Forest growths also were seriously affected. The belief was common that conditions required the exclusion of all sheep from many, at least, of the National Forests.

In the first year or two of administrative control, however, a policy of regulation was entered upon. Largely as a result of the expert advice given by scientifically trained men of this department, the beginnings of systematic grazing control were developed. It was obvious that only specialized knowledge of range vegetation and of grazing methods could constitute a basis for devising such an adjustment of use to existing conditions as would serve to restore the carrying power of the range without undue disturbance of the established stock industry. Experience soon proved that mere assistance in devising an administrative policy was not adequate to meet the needs of the situation. Expert knowledge was needed also in carrying the policy into effect. It was perception of this fact which led the Commissioner of the General Land Office and the Secretary of the Interior to urge the transfer of the National Forests to the Depart-

ment of Agriculture. In his annual report for 1903 the Commissioner of the General Land Office said:

> The work of establishing a forest service for the care and administration of the reserves * * * has been developed along such practical lines as fall within the province of the Interior Department. The experience of these five years abundantly testifies to the need for efficient work of a scientific character. The dangers to which the reserves are exposed from fires, timber depredations, and other sources make the establishment of an efficient protective force a matter of great importance. Following closely upon that, however, must come the application of scientific methods in dealing with the many and various forest problems in connection with the various industries affected thereby. * * * Elementary efforts need to give way in the course of development of such a system. It would seem, therefore, that the point has been reached when the work should be committed to the care of men who have had the scientific and practical training needed to cope with work involving such far-reaching issues. The Bureau of Forestry of the Department of Agriculture is properly organized and equipped to carry on this branch of the work.

Recommendations to the same effect were repeated the following year. An act of Congress, which became law on February 1, 1905, effected the transfer.

STATISTICS OF USE OF THE NATIONAL FORESTS.

The salient fact disclosed by the statistics of use of the forests since that time is the immense acceleration affected by the transfer in the rate at which the resources were made available. In 1905 there were issued not quite 8,000 grazing permits; in 1912, over 26,000. The 1905 permits were for approximately 600,000 cattle as against 1,400,000 in 1912, 60,000 horses as against 95,000, and less than 1,800,000 sheep as against nearly 7,500,000. In 1905 the number of timber sales made was about 400; in 1912, nearly 5,800. The 1905 sales covered about 100,000,000 board feet, while those of 1912 covered 800,000,000 board feet; and the receipts from timber sales rose from less than $86,000 in 1905 to over $1,000,000 in 1912. In 1905 not quite 3,400 free-use permits were issued; in 1912, nearly 40,000. These permittees in 1905 took from the forests free of charge the equivalent of about 27,000,000 board feet; in 1912, over 123,000,000. In 1905 less than 300 applications for special-use permits were granted; in 1912, nearly 5,000. It is true that in comparing these figures allowance must be made for the fact that on June 30, 1905, the total area of the National Forests was less than 86,000,000 acres as against over 185,000,000 acres on June 30, 1912; but with all allowances made the evidence remains impressive and overwhelming. The application of technical management is the master key that is everywhere unlocking the old-time reserves to the public, developing their resources, and demonstrating the methods by which, under public control, they can be made to contribute most fully to our permanent economic welfare.

Time altogether fails in which to set forth even cursorily what has been done on the National Forests. From long before the transfer

the principal source of information concerning the lands suitable for inclusion in forests by presidential proclamation was the Bureau of Forestry. In gathering that information the foresters of the department raced against a swarm of timber cruisers in private employ. A corps of efficient public servants has been built up. Business methods serving the convenience of users have been worked out. A protective system of high efficiency now makes the forests as nearly safe against fire as the too small force and too meager development of means of communication and transportation permit. All in all, as a great constructive accomplishment the National Forests and the administrative system under which they are made to serve their rightful part in our national economy deserve to rank, and will rank, among the notable triumphs of this generation.

ADMINISTRATIVE BOARDS.

THE REFEREE BOARD.

On February 20, 1908, the Secretary of Agriculture appointed Dr. Ira Remsen, president of Johns Hopkins University; Dr. Russell H. Chittenden, dean of the Sheffield Scientific School, Yale University; Dr. John H. Long, of Northwestern University; Dr. Alonzo Taylor, at that time of the University of California, but now of the University of Pennsylvania; and Dr. Christian A. Herter, of Columbia University, as consulting scientific experts of the Department of Agriculture, and four days later organized them into what is known as the Referee Board. Dr. Herter has since died, and he has been succeeded by Dr. Theobald Smith, of Harvard University.

This board was appointed because a number of large manufacturers of articles of food requested President Roosevelt to select a number of disinterested, scientific men competent to pass upon the question as to whether sulphur dioxid, saccharin, and benzoate of soda are harmful when used in foods. These manufacturers assured the President that they would discontinue the use of these substances in food if such a board found them to be harmful. President Roosevelt corresponded with the presidents of some of the leading universities in the country as to what men were best qualified to make the necessary investigations as to the substances that were harmful or injurious to health when used in foods, and personally selected the five men who were appointed members of the board.

It is the duty of the board to consider and report to the Secretary of Agriculture the wholesomeness or deleterious character of such foods or such articles used in foods as may be referred to them by the Secretary of Agriculture.

The committee of the House of Representatives which considered the pure-food bill subsequently enacted into law apparently

contemplated the employment of eminent scientists to advise the Secretary as to the harmfulness of substances in foods, because the view was expressed in the deliberations of the committee that the Secretary should be allowed a free hand in selecting experts on questions of the wholesomeness of certain foods and the articles used therein. Congress, in the Agricultural appropriation bill, evidently indorsed this view, for this bill contained a provision authorizing the Secretary of Agriculture to employ such assistants as he might consider necessary to secure the enforcement of the law. In his opinion of April 14, 1909 (27 Opinions, 301), the Attorney General held the appointment of the members and the organization of these members into a board to be legal.

There may be questions arising in the administration of the food and drugs act on which the Secretary of Agriculture may desire an opinion independent of that expressed by the Bureau of Chemistry, as is the case when a great number of food manufacturers of the country claim that the opinion of the Bureau of Chemistry is at variance with the scientific knowledge of the present day.

The questions as to the harmfulness of the use in foods of the following substances were referred to the referee board: Benzoate of soda, saccharin, sulphur dioxid, alum, and sulphate of copper. The board has reported on three of these questions—that is, on the use of benzoate of soda, saccharin, and sulphate of copper—and the other questions are still pending before it. In arriving at conclusions on questions submitted to them the board must make original investigations, and on the questions determined independent original investigations were made by several members of the board.

BOARD OF FOOD AND DRUG INSPECTION.

In 1907 a Board of Food and Drug Inspection was organized in the Department of Agriculture to assist the Secretary of Agriculture in the administrative work connected with the enforcement of the food and drugs act of June 30, 1906. The duties of this board as defined in General Order No. 111 creating it are as follows:

* * * The board will consider all questions arising in the enforcement of the food and drugs act of June 30, 1906, upon which the decision of the Secretary of Agriculture is necessary, and will report its findings to the Secretary for his consideration and decision. All correspondence involving interpretations of the law and questions arising under the law not theretofore passed upon by the Secretary of Agriculture shall be considered by the board. The board is directed to hold frequent meetings at stated times, in order that findings may be reported promptly.

In addition to the above duties, the Board of Food and Drug Inspection shall conduct all hearings based upon alleged violations of the food and drugs act of June 30, 1906, as provided by regulation 5 of the Rules and Regulations for the Enforcement of the Food and Drugs Act, approved October 17, 1906.

This board has conducted a large number of hearings on cases of alleged violations of the law and has considered all cases reported by the Chief of the Bureau of Chemistry as being in violation of the law. In addition the board has conducted an extensive correspondence relating to the application of the law to various products and the complex questions arising in the interpretation of the law.

From time to time the board, with the approval of the Secretary of Agriculture, issues decisions defining the attitude of the department on questions relating to the application of the law to the food and drug industries. These decisions serve as a guide to the officials in charge of the enforcement of the law and acquaint the manufacturers, jobbers, and dealers with the attitude of the department in these matters.

SOME OF THE IMPORTANT DECISIONS.

Among the important decisions so far issued, in addition to those decisions merely explaining in greater detail and amplifying the regulations, may be mentioned the following:

(1) Prohibiting the use of coating of any kind on rice if the product "be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed," and providing in any case that rice when coated in any manner should be labeled with the name of the extraneous substances used. (2) Restricting the use of coloring matter in food products to certain harmless vegetable colors which can only be used after having been tested and approved by the department. (3) Prohibiting the use of all chemical preservatives that are known to be harmful, and requiring that when any preservatives are used the fact of their use must be stated on the label. (4) Prohibiting the bleaching of flour with nitrogen peroxid. (5) Prohibiting the use of shellac and other gums for coating chocolates and other confections. (6) Restricting the sale of canned goods which contain salts of tin derived from the solvent action of the contents of the package upon the tin coating. (7) Prohibiting the shipment in interstate commerce of green, immature citrus fruits which have been artificially colored by holding in a warm, moist atmosphere for a short period of time after removal from the tree. (8) Prohibiting the use of saccharin and copper sulphate in foods. (9) Prohibiting the importation of and interstate commerce in absinth.

These are only a few illustrations showing the nature of the decisions of the board. The decisions are published when issued and are distributed to the trade or any interested parties.

INSECTICIDE AND FUNGICIDE BOARD.

Responding to a growing demand by agricultural interests and manufacturers for Federal control of interstate commerce in insecti-

cides, Paris green, lead arsenates, and fungicides, Congress passed a law, which was approved April 26, 1910, known as the insecticide act of 1910. The duty of collecting and examining official samples of articles coming within the meaning of the law and of certifying violations thereunder to the Department of Justice for prosecution was reposed in the Department of Agriculture, and for the performance of this duty a board of four scientists selected from as many bureaus of the department was created to assist the Secretary of Agriculture.

Official samples of insecticides and fungicides which have entered into interstate commerce or have been manufactured or sold within a State are collected by authorized sample collectors of the Department of Agriculture and are transmitted under seal, accompanied by the necessary evidence of interstate movement, to the Insecticide and Fungicide Board. Each sample is carefully analyzed and tested to determine whether it is adulterated or misbranded within the meaning of the law.

The results of examination are then considered by the board, and if the article is found to be in violation of the law recommendation is made to the Secretary of Agriculture through the Solicitor of the department that the responsible parties be cited to a hearing in order that they may have an opportunity to show any failure or error in the findings of the analyst or examiner. Hearings are appointed at such places and are conducted by such officers of the department as may be most convenient for all parties concerned.

Reports of such hearings are forwarded to the board for careful review, and if it still appears that any of the provisions of the law have been violated the facts are certified and all collateral evidence transmitted to the Solicitor, who in turn submits the same to the Secretary of Agriculture for reference to the Attorney General and the proper United States attorney, with recommendation that the offending parties be prosecuted. After judgment of the court, notices of judgment are prepared and given the widest possible publicity.

Various investigations have been made concerning insect powder, Paris green, tobacco powders, Bordeaux mixtures, and other insecticides and fungicides, and half a dozen orders have been issued.

FEDERAL HORTICULTURAL BOARD.

Under the act of Congress approved August 20, 1912, a Federal Horticultural Board, consisting of five members drawn from various bureaus of the department, was authorized and the members of the board were soon appointed. The duties of the board are to prevent the importation of nursery stock into the United States except under such circumstances as insure its freedom from plant diseases and

insect pests; to prevent the transportation in interstate commerce of imported nursery stock except under prescribed regulations to prevent the spread of plant diseases and insect pests; to prevent the importation of any plants, fruits, vegetables, roots, bulbs, seeds, and other plant products not included in the term "nursery stock" when such importation would introduce a plant disease or an insect pest.

The Secretary of Agriculture is authorized and directed to quarantine any State or any part thereof when he shall determine the fact that a dangerous new plant disease or insect infestation exists therein.

Among the notices of quarantine already issued by the Federal Horticultural Board is one forbidding the importation of certain varieties of the pine tree from specified European countries; one prohibiting the movement from Hawaii into any other part of the United States of various specified fruits, berries, and seeds; one forbidding the importation of potatoes from certain portions of Europe, the West Indies, and North America; and one prohibiting the movement of Christmas trees, holly, laurel, and other decorative Christmas greens grown in New England from that part of the country to other States.

This quarantine law to prevent the introduction of plant diseases and insect pests was caused by the immense damage that has been done by those that already have been introduced. Among the prominent insect pests that have caused enormous losses to this country are the gipsy moth, the brown-tail moth, the leopard moth, and the elm-leaf beetle, and to these should be added the notorious San Jose scale, the black scale, the white fly of the orange, and the codling moth; and there are the alfalfa weevil, the cotton boll weevil, the cabbage butterfly, and many others.

Among the foreign plant diseases that have been introduced into the United States, prominent ones are the asparagus rust, the cabbage blackleg, European canker of the apple tree, the anthracnose of the grapevine, and to these should be added the crown wart of alfalfa, the rust of clover, the black smut of rice, the blister rust of white pine, and the dreaded blight of the chestnut tree; and there are the rust of the carnation, chrysanthemum, and hollyhock.

EX-OFFICIO FUNCTIONS OF THE SECRETARY OF AGRICULTURE.

As a part of the work of this department, it is pertinent to mention the ex-officio duties of the Secretary, most of them created within the last 16 years.

The Secretary of Agriculture is designated a member of the board of appeals from decisions of the Commissioner of Internal Revenue as to oleomargarine and substances in imitation of butter, and as to deleterious ingredients in filled cheese.

He is authorized and directed to make rules and regulations, to be approved by the Postmaster General, under which injurious insects may be mailed, transported, etc., interstate.

The Secretary of Agriculture, the Secretary of the Treasury, and the Secretary of Commerce and Labor are to make uniform rules and regulations for carrying out the provisions of the food and drugs act, and to make uniform rules and regulations for carrying out the provisions of the insecticide act of 1910.

A National Forest Reservation Commission was created, consisting of the Secretary of Agriculture, the Secretary of War, the Secretary of the Interior, two members of the Senate, and two members of the House of Representatives, to consider and pass upon lands recommended for purchase for the protection of navigable streams.

An appropriation was made in 1912 to be expended by the Secretary of Agriculture, in cooperation with the Postmaster General, in improving the condition of the roads used in rural delivery and for ascertaining benefits in the operation of the Rural Delivery Service to local inhabitants in transportation of products.

OFFICE OF THE SOLICITOR OF THE DEPARTMENT.

IMPORTANT AND FAR-REACHING LAWS.

During the 16 years covered by this report there have been a number of important and far-reaching measures enacted by Congress designed for the protection of the health, welfare, and prosperity of the people of the United States. These measures are the culmination of scientific work and investigation of the Department of Agriculture, which exposed conditions requiring legislation to remedy them. Some of the more important acts referred to are the act of February 2, 1903, for the suppression of contagious, infectious, and communicable diseases of live stock; the act of March 3, 1905, which is an enlargement of the above act; the act of May 25, 1900, commonly known as the Lacey Act; the act of June 29, 1906, commonly known as the 28-hour law; the food and drugs act of June 30, 1906; the meat-inspection law of June 30, 1906; the insecticide and fungicide act of April 26, 1910, and the plant quarantine act of August 20, 1912.

All these statutes commit to the Secretary of Agriculture not only the details of their administration, but also the duty of enforcing their penal provisions. Hence it is that the Department of Agriculture has been charged with the execution of some of the most important penal statutes of the United States.

That such should be the case is directly due to the fact that the penal statutes referred to have grown out of conditions which were exposed by the department in its work to enable it to carry out the

purpose of its organization, namely, to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word. All these statutes directly bear upon agricultural industries of the people of the United States, and logically their administration has been committed to the Department of Agriculture.

SUPPRESSION OF CONTAGIOUS DISEASES OF LIVE STOCK.

The act of May 29, 1884, established a Bureau of Animal Industry in the department, largely for the purpose of advising with State and Territorial officials in regard to the suppression of contagious diseases of live stock. Practically no authority was granted by this act to the Commissioner of Agriculture to regulate interstate commerce in diseased live stock. Sections 6 and 7 of the act prohibited under penalty the shipment and transportation of live stock actually diseased, the penalty, however, to be imposed only in case the animals were known to be diseased at the time they were shipped or transported.

This act did not meet the exigencies of the live-stock industry in the United States, and the department, having found through its investigations that, despite the law, diseases of live stock continued to spread over large areas of the country, recommended to Congress additional legislation to empower the Secretary of Agriculture more effectually to suppress the spread of contagious and infectious diseases of live stock. The recommendations culminated in the passage of the act of February 2, 1903, which authorized the Secretary of Agriculture to establish rules and regulations for the exportation and transportation of live stock between States of the United States and foreign countries where he had reason to believe live-stock diseases existed. This act also empowered him to seize, quarantine, and dispose of any hay, straw, forage, or similar material, or any meats, hides, or other animal products coming from an infected foreign country to the United States, or from one State of the Union to another, whenever in his judgment such action was advisable in order to guard against the introduction or spread of live-stock contagion. Suitable penalties were enacted for violation of the statute or disregard of the regulations promulgated thereunder by the Secretary of Agriculture.

The statute accomplished in a measure the general results for which it was enacted, but did not entirely cover the necessities of the case, and, as the act was also held by the United States District Court for the District of Nebraska to be unconstitutional, so far as it empowered the Secretary to make rules and regulations violations of which should constitute a crime, early in the third session of the

Fifty-eighth Congress the Secretary recommended the enactment of a more comprehensive law which would give him the power, after ascertainment of the fact, to quarantine any State or Territory or portion thereof where contagious, infectious, or communicable live-stock diseases should be found to exist, in order that these diseases might not be spread through the medium of live stock which themselves might not be diseased. This recommendation resulted in the passage of the act of March 3, 1905, which is the act under which an epidemic of foot-and-mouth disease in 1908–9 was restricted to the localities in which it occurred until its successful eradication.

As a result of the administration of these acts the department has been able, during the 16 years covered by this report, to extirpate some of the most virulent live-stock diseases in large sections of the United States, with a consequent lifting of the Federal and State quarantine over substantial areas. This act was sustained as constitutional by the District Court of the United States for the Western District of Kentucky in December, 1908.

Between July 1, 1906, and June 30, 1912, 454 cases under the foregoing acts have been reported to the Attorney General, and of this number 160 cases have resulted in convictions and the imposition of fines amounting to $16,375.

THE LACEY ACT.

The act of May 25, 1900, commonly known as the Lacey Act, was passed upon the recommendation of this department to meet two distinct evils: (1) The importation into the United States of animals and birds which were ascertained by the department to be destructive to crops and poultry, and (2) commerce between the States in game killed in violation of State laws. Under this act importation into the United States of the destructive fruit bats, mongooses, and other predatory species has been prevented, and impetus has been given to legislation in the several States for the protection both of game and nongame birds and mammals. In 1909 the department having found through its efforts to enforce this act that it could not be given the effective operation which was plainly intended by Congress until a provision was added prohibiting the shipment from one State to another of game shipped in violation of local law, as well as game killed in violation of local law, recommendation was made that, in the codification of the act for purposes of the Penal Code, an amendment be inserted to cover shipment of game in violation of State laws, as well as the shipment of game killed in violation of local laws. Evidence to establish the unlawful killing of game was difficult to procure, and the department found itself very much handicapped in

the enforcement of this provision. The shipment of game in violation of local laws was as much within the spirit of the act as the shipment of game killed contrary to law.

Under the enlargement of the act, as it now appears in the Penal Code, the department has been able to report a substantial number of cases to the Attorney General, and success has crowned the efforts of the department to check illicit interstate commerce in game.

Since July 1, 1906, there have been reported to the Attorney General 74 cases for violation of the act, and convictions have been secured in 22 of these.

THE TWENTY-EIGHT HOUR LAW.

The act of June 29, 1906, commonly known as the twenty-eight hour law, is a reenactment, with substantial and important amendments, of the act of March 3, 1873. The original act was intended to prevent cruelty to animals while in transit in interstate commerce; but, in its endeavor to enforce the act, the department was confronted with several decisions of the courts which narrowed its operation to such an extent that the benefits which were expected to accrue from its execution were in a considerable measure lost.

It had been held that the law did not apply to the receivers of railroads, and that it did not cover animals moving from a State into a Territory, or from a Territory into a State; both serious omissions at that time. Under the old law animals in transit were unloaded under circumstances of brutality and into pens in which the mud was 2 feet or more deep. The facilities for feeding, watering, and resting in the pens into which they were unloaded were entirely inadequate. There was no provision in this law for the owner of the stock, if he so elected, to furnish their food, and the carriers, under the provision giving them a lien upon the stock for their food, accumulated exorbitant charges against the stockmen. The requirement was peremptory that the stock be unloaded at the expiration of 28 hours. This in many cases operated not only disadvantageously to the stock themselves, but also to the owners and shippers, since by continuing the trip a few more hours the stock could have been delivered at their destination under circumstances both humane to the animals and profitable to their owners. The amendments which were recommended by the department were embodied by Congress in the act of June 29, 1906, and the law has been rigidly enforced during the entire time since its passage.

Since July 1, 1906, there have been reported to the Attorney General 3,795 cases, of which 1,784 have resulted in judgments for the United States and the payment into the Treasury of $212,745.

FOOD AND DRUGS ACT.

The food and drugs act of June 30, 1906, was the result of repeated efforts of the department to secure the enactment by Congress of a law to suppress widespread adulteration and misbranding of foods and drugs passing in commerce between the several States and Territories and imported into the United States from foreign countries. Prior to the enactment of this law the department, after most exhaustive investigation, had determined the standards of purity which general opinion had established for the more important food products. Departures from these standards were the rule rather than the exception, and deceit in the manufacture and sale of foods and drugs had grown to such an extent that many manufacturers regarded any interference with their business as an invasion of vested rights.

Immediately upon the passage of the act the department organized the requisite force for its vigorous administration and has prosecuted its work under the act without abatement ever since. The constitutionality of the act has been sustained by a number of the Federal courts, and numerous decisions of the Federal courts have construed its provisions. During the operation of the law 3,456 cases have been reported to the Attorney General involving prosecutions against individuals and private corporations, resulting in 1,226 convictions and the imposition of fines amounting to $47,982; 1,296 seizures of foods and drugs have been made, resulting in 867 decrees of forfeiture and condemnation. The department has published 1,626 notices of judgment as required by the act.

MEAT-INSPECTION LAW.

The meat-inspection law of June 30, 1906, was the culmination of efforts of the department for years prior to secure the enactment of a law which would authorize rigid inspection of meat and meat-food products intended for interstate and foreign commerce. A makeshift statute was passed and approved August 30, 1890, but the statute did not provide for post-mortem inspection at the time of slaughter; furthermore, it was confined to salted pork and bacon intended for exportation to foreign countries the Governments of which should require inspection thereof. The measure failed of its purpose, however, for in the next annual report of the Secretary of Agriculture he urged the enactment of a law which would provide for national inspection of cattle at the time of slaughter. In compliance with the Secretary's recommendation, the act of March 3, 1891, was passed.

This act made it mandatory upon the Secretary to cause an antemortem inspection to be made of all cattle, sheep, and hogs which were the subject of interstate commerce and which were to be slaught-

ered, and at slaughterhouses, etc., and provided that there might also be made, when deemed by the Secretary of Agriculture advisable, a post-mortem examination. The restrictions which had theretofore been placed by foreign countries on the importation of meat-food products from the United States were in a measure removed.

Notwithstanding the benefits which accrued from the enforcement of this act to American producers of meats, the statute still failed to meet the continued and growing abuses in the production and packing of meats and meat-food products. In the spring of 1906 rumors gained credence that the packing houses of the country were not conducted in a sanitary manner and that the inspection under the acts of 1891 and 1895 was not conducted efficiently. The Secretary of Agriculture appointed a committee to investigate conditions at one of the large packing centers, and the President of the United States appointed a committee for the same purpose. When the report of the latter committee was received by the President, he transmitted it to Congress on June 4, 1906, accompanied by a message in which he stated that a law was needed to enable the inspectors of the General Government to inspect and supervise from the hoof to the can the preparation of meat-food products. The President recommended to Congress the passage of an act to provide for a Federal inspection of meats and meat-food products at all stages of preparation. The report of the committee appointed by the Secretary of Agriculture was also transmitted to Congress by the President. This report embodied the recommendation that interstate commerce in meat and meat-food products of cattle, sheep, swine, and goats be prohibited, unless they should be marked in accordance with the regulations of the Secretary of Agriculture to show that they had been inspected.

In compliance with these recommendations, Congress enacted the meat-inspection law of June 30, 1906, and under it the department has not only been enabled in a large measure to prevent interstate commerce in diseased and unsound meats and meat-food products, but it has also been able to enforce sanitary measures in the packing-houses.

There have been reported to the Attorney General 311 cases of violations of the meat-inspection law, of which 168 have resulted in convictions and the imposition of fines amounting to $11,117, as well as a number of jail sentences.

INSECTICIDE AND FUNGICIDE ACT.

The insecticide and fungicide act of April 26, 1910, was passed by Congress in furtherance of the recommendation of the Secretary of Agriculture as a result of investigations which had been made by the department into the character and quality of material on the market and widely sold under representations of efficacy in the de-

struction of harmful and injurious insects and fungus diseases. The annual report of the Secretary of Agriculture for 1905 stated that the investigations of the department had shown that many of the insecticides offered to the farmers of this country are of little value and that the price demanded and the value of the goods are not always proportionate. Samples of insecticides widely in use were examined in the Bureau of Chemistry and found not only to want the efficacy ascribed to them, but also to be themselves more destructive than the insects or diseases they were intended to destroy. The act follows in substantial form the provisions of the food and drugs act of June 30, 1906, and is intended to suppress interstate commerce in adulterated and misbranded insecticides and fungicides.

There have been reported to the Attorney General for prosecution and for seizure of adulterated and misbranded goods 58 cases, and convictions have resulted in 7 cases.

PLANT QUARANTINE ACT.

The plant quarantine act of August 20, 1912, is the successful outcome of a number of attempts since 1899 to secure the enactment by Congress of a comprehensive law which would enable the Federal Government to prevent the importation into the United States from foreign countries of nursery stock infested with injurious insects or affected with plant diseases, and also to prevent the spread of insect pests and plant diseases from one State to another. The act in its general scheme follows the cattle quarantine law of 1905, and under its provisions the Department of Agriculture, by regulations promulgated by it, now has the power to control plant diseases and parasites coming into the United States, as well as those which originate in or are indigenous thereto.

TRESPASSES ON NATIONAL FORESTS.

The creation of National Forests out of lands in the public domain suitable for the purpose was authorized by the act of March 3, 1891, and the jurisdiction over them was conferred upon the Secretary of the Interior by the act of June 4, 1897. This jurisdiction continued until February 1, 1905, when it was transferred to the Secretary of Agriculture. Since the transfer of this jurisdiction the National Forests have multiplied in number and increased in territory until, at the present time, there are nearly two hundred million acres of public lands reserved as National Forests.

From February, 1905, until December, 1908, the department endeavored to administer the forests from Washington, but the increase in extent of the forests and the increasing use of the lands for purposes authorized by law plainly indicated that the only successful

method of administering them lay in the organization and maintenance of districts with headquarters at a convenient point in each district. So, on December 1, 1908, 6 districts were organized in the West, where, of course, all the National Forests were situated. This system has resulted in their successful and businesslike administration.

Prior to the creation of the National Forests stockmen were accustomed to use the lands embraced in them without regulation in any respect by the Government, and the Government not only received no return for the valuable resources furnished, but there was also constant friction, sometimes even approaching border warfare, between owners of different kinds of stock, or even between owners of the same kinds, growing out of the natural tendency of individuals to monopolize the more valuable areas for their own profit. The department, under its authority to regulate the use of the lands in the National Forests, has by carefully planned regulations provided for the use of grazing lands, and all stockmen are afforded an opportunity to enjoy the privileges which the forests can provide and the Government receives a compensation for the use of its grazing lands. Some hostility to the permit system of administering the grazing lands was encountered for a time, but it can confidently be said that the stockmen of the West now regard the administration of grazing lands on the National Forests as conducive to the peace and welfare of everyone who desires to graze stock thereon. Since the Department of Agriculture assumed control of the National Forests the returns from grazing permits have averaged $1,000,000 a year, and at the same time users of the forests have had the benefit of a rate of charge much below the rate prevailing on private lands in the same vicinity. The validity of the grazing regulations has been sustained by the United States Supreme Court.

At the time of the transfer of jurisdiction over the National Forests to the Secretary of Agriculture a number of very extensive timber trespasses had been committed, both on lands prior and subsequent to their inclusion in forest reserves. The department made careful investigation into all these trespasses, and during the last two or three years brought them to the attention of the Attorney General. Suits were instituted, and the Government has recovered upwards of half a million dollars for these depredations, some of which were begun 20 years ago. Sales of timber from the forests have averaged three-quarters of a million dollars a year since this department assumed control of them, and, at the same time, the condition of standing timber has been greatly improved by silvicultural investigation and experiments, and large areas where trees never grew have been seeded and forested.

ILLEGAL CLAIMS TO LANDS IN THE NATIONAL FORESTS.

The department has worked out a system of water-power control which is under most successful operation at the present time. It is, of course, natural in the administration of nearly 200 million acres of land under regulations which permit the use of the lands for private purposes that numerous and important legal questions will arise, to say nothing of the preparation of necessary contracts and other instruments to perform properly the business of the department in connection with these lands. These exigencies made it imperative that legal assistants should be detailed to the 6 Forest Service districts for the performance of the legal work of these districts. Since the spring of 1910 these legal assistants have been in the office and under the supervision of the Solicitor of the department. Two have been assigned to each of the districts, except that in districts 4 and 5, where it has been found possible to perform the work with one assistant, only one has been assigned to each. The work of these district assistants to the Solicitor is varied and extensive, including preparation of all contracts and other written documents, legal advice to the district foresters, assistance to the United States attorneys handling the department's cases, and cooperation with the agents of the Interior Department in the prevention of both illegal and unwarranted acquisition by individuals of lands in the National Forests under the various public land laws. Many of these claims were and are known or believed to be either fraudulent or without warrant of law. It was and is, therefore, the duty of the Secretary of Agriculture, as custodian of these lands, to see that these claims were and are not allowed to be perfected and title procured by patent. The department's efforts to defeat fraudulent and unauthorized claims to lands in the National Forests had been successful in a large measure, but it was realized that closer cooperation between the Department of the Interior and the Department of Agriculture was requisite to that degree of success which would insure the best results for the Government.

With such cooperation in view, the two departments, in June, 1910, entered into an agreement by which the Department of Agriculture was to be recognized in the Interior Department as an active contestant in all claims cases against which an adverse report was made by forest officers. This agreement embodied also the provision that the law officers of the Department of Agriculture should have the right to attend and participate in all hearings ordered by the Department of the Interior for the taking of testimony; and the right of appeal from decisions of the Commissioner of the General Land Office adverse to the Government in Forest Service cases was likewise accorded the law officers of the Department of Agriculture.

Since this agreement went into force the efforts of the department to defeat fraudulent and unwarranted claims to lands have been crowned with conspicuous success.

LEGAL BUSINESS FOR THE FOREST SERVICE.

A record of the legal business for the Forest Service has been preserved since February, 1910, and some estimate of the extent and scope of this work may be gathered from the following brief summary of cases handled during that time:

The Solicitor of the department has rendered 2,627 written opinions to the Forest Service on legal questions arising in the administration of the National Forests; upward of 3,000 cases involving claims to lands under public-land laws have been handled, of which fully two-thirds have been decided in favor of the Government; 73 cases of illegal occupancy of lands in the National Forests have been reported to the Attorney General; 193 grazing trespass cases have been similarly reported, resulting in the recovery of damages to the amount of $5,890 actual and $1,525 punitive and fines to the extent of $1,173; 98 fire trespass cases have been reported, resulting in the imposition of fines amounting to $1,178 and the collection of damages to the amount of $61,427, and in addition 62 prosecutions have been maintained under State laws, resulting in 52 convictions; 122 timber trespass cases have been reported to the Attorney General, resulting in the recovery of damages to the extent of $316,862 and the imposition of fines amounting to upward of $500, together with several jail sentences. Besides cases reported to the Attorney General, administrative settlements for trespasses on the forests have been made in 224 cases, resulting in the payment to the Government of $31,643.

WEEKS FORESTRY LAW.

The maintenance and administration of the National Forests in the West having demonstrated the importance of protection of forest lands as a means of conserving and promoting water flow, the department for a number of years past urged upon Congress the advisability of the acquisition of timbered lands in the East as a means of conserving and promoting the navigability of navigable streams in the Eastern States where the Government has never owned lands. Especial attention was called to the rapid disappearance under wasteful methods of large areas of timber on the watersheds of important navigable streams in and contiguous to the Appalachian Mountain Range. The recommendations of the department culminated in the act of March 1, 1911, commonly known as the Weeks Forestry Law, under which the Secretary of Agriculture is authorized to examine, locate, and recommend for purchase such lands as, in his judgment,

may be necessary for the regulation of the flow of navigable streams, and to report the results of such examinations to a commission created by the act and designated the National Forest Reservation Commission.

Upon the approval of the purchase by the commission the Secretary is authorized to purchase the lands for the United States and thereafter to organize them into National Forests, to be administered, with certain limitations, as other National Forests are administered. An appropriation of $13,000,000 was made for purposes of the act, and active operations were commenced immediately upon its approval.

There are at present 45 contracts with owners of lands to convey to the Government lands aggregating 268,627 acres, situated in New Hampshire, Virginia, Tennessee, North Carolina, and Georgia. Negotiations are being conducted for the purchase of additional areas in these States and others where the control of forests is essential to a conservation of the water flow in navigable rivers. One tract of 8,213 acres in North Carolina has already been acquired by the Government, and another tract of 32,000 acres in Georgia will be acquired as soon as adjustment can be had in the condemnation proceedings pending. The department's record examiners attached to the Office of the Solicitor have already examined the titles to a large portion of the lands embraced within the contracts for conveyance to the United States, and in several cases their reports have been submitted to the Attorney General.

CONCLUSION.

The record of 16 years has been written. It begins with a yearly farm production worth $4,000,000,000 and ends with $9,532,000,000. Then, farmers were loaded with debts that were a painful burden; prosperity followed and grew with unexampled speed. Then, the farmer was a joke of the caricaturist; now he is like the stone that was rejected by the builder and has become the head stone of the corner. Beginnings have been made in a production per acre increasing faster than the natural increase of population. There has been an uplift of agriculture and of country life.

In this movement the department has been gradually equipped to occupy a foremost place. It came to learn and it remained to teach. Its influence penetrates the remotest neighborhood. It performs a mission of welfare and happiness to farmers and to the whole Nation. The millions of dollars that it costs are returned in tens of millions of wealth saved and wealth produced.

The department is prepared to continue and increase its public service. During 16 years it has progressed from the kindergarten through the primary, middle, and upper grades of development until now it has a thousand tongues that speak with authority. Its teach-

ings, its discoveries, and its improvements are permeating the national agricultural life. The forces that are at work must cause ever-increasing results.

The great and growing movement carried on by the department for agricultural betterment has not been sustained solely by one man, nor by a few men. A choice corps of scholarly experts in their special lines of endeavor has been growing in membership, in breadth of view, and in the practical application of their efforts. They have been and are men both good and true, men with high ideals, often sacrificing greater remuneration in private employment for love of the great results of their public service. No great work can be begun, nor sustained, by this department without such men.

Men grow old in service and in years, and cease their labor, but the results of their labor and the children of their brains will live on; and may whatever of worth that is in these be everblooming.

The details of the operations of the department will be found in the reports of the heads of the several bureaus, divisions, and offices.

Respectfully submitted.

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *November 27, 1912.*

REPORT

OF THE

SECRETARY OF COMMERCE AND LABOR

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, December 16, 1912.

To the PRESIDENT:

I have the honor to submit my fourth annual report.

COST OF OPERATION AND MAINTENANCE OF DEPARTMENT.

The total appropriations for the Department for the fiscal year ended June 30, 1912, were $15,914,805.23, which, compared with the appropriations for the previous fiscal year of $16,150,940.58, is a decrease of $236,135.35. The total appropriations for the current fiscal year (to end June 30, 1913) amount to $15,277,999.35.

During the fiscal years 1911 and 1912, and a portion of the fiscal year 1913, a considerable part of the work for the Thirteenth Decennial Census has been or is being done, and appropriations of $3,000,000, $2,000,000, and $392,000 made for these fiscal years are included in the total appropriation figures given above.

To arrive at a better basis for comparison of the cost of operation and maintenance, the amounts appropriated for the Thirteenth Decennial Census, for construction, and for such special purposes as the payments under the fur-seal convention should be deducted from the total appropriations. There should be added, however, sums sufficient to cover the expenses of the Bureau of the Census for regular work, which was not provided for by direct appropriation during the period of the Thirteenth Decennial Census. By this method it is found that the net appropriations for operation and maintenance for the Department were $13,952,927.37 in 1911, $13,520,800.02 in 1912, and $13,604,499.35 in 1913.

It is apparent, therefore, that for the three consecutive years the appropriations for operating this Department have been kept at substantially the same figures. Compared even with earlier years, the increase has been slight. For illustration, for the fiscal years ended June 30, 1908, 1909, and 1910, following the same method to arrive at the operating expenses, the appropriations were $12,649,566.84, $13,144,518.84, and $13,559,586.93, respectively.

RECEIPTS.

The miscellaneous receipts which were remitted to the Treasury by this Department, consisting chiefly of immigrants' head tax, naturalization fees, proceeds of sale of fur-seal skins, and tonnage tax, and in smaller measure sales of documents and condemned Government property, in 1912 amounted to the total sum of $5,343,540.23.

Furthermore, it is estimated that of the appropriations for the fiscal year 1912 about $353,000 will be returned to the Treasury as unused. In other words, of the total appropriations for the fiscal year 1912 for the Department, $15,561,805.23 has been or will be expended, and of this sum the Department has contributed by way of collections, chiefly from sources which do not constitute a burden on the public, the sum of $5,343,540.23, or a little more than one-third of the entire sum expended. This is practically the same showing which was made in the earlier years of this Administration.

PERSONNEL.

The force, based on figures of date August 24, 1912, was 9,964, which represents a reduction of 449 as compared with the previous year. This reduction is more apparent than real, because certain positions were shifted from the permanent to the temporary class. Essentially the force is about the same and consists of 9,964 permanent places and 12,596 temporary employments for one or more days, weeks, or months during the year. Temporary employment is had chiefly in the field service of the Coast and Geodetic Survey, the Lighthouse Service, the Bureau of Fisheries, and the Immigration Service, where temporary work, season, and other conditions render continued employment impracticable. Of the entire force, permanent and temporary, only 1,886 are stationed or have their headquarters in Washington.

THE DEPARTMENT'S ACTIVITIES.

It would be unsafe to conclude that this comparative statement of appropriations and force employed marks the measure of work accomplished during the same years. Judged by earlier standards, the results have traveled far beyond the expenditures. This is to be attributed in part no doubt to the fact that it required time and experience to perfect a comparatively new organization; but in part also, I trust, to the earnestness with which the policy of good and economic administration has been impressed upon the service and has been accepted and carried out by the force. A reading of the reports of the bureau chiefs will show this. In some offices, as for illustration in the Bureau of Lighthouses and the Division of Publications, actual tables embodied in the reports amount to a demonstration; in others the correctness of this statement is proved by a mere reference to the additional duties and labor

required by new legislation; in still others this conclusion must depend upon a closer examination of the work done.

The sum of $15,914,805.23 includes every appropriation, whatever the date, character, or purpose, which was placed at the disposal of the Department for the last fiscal year. That sum, therefore, covers not only the cost of administration in twelve different bureaus, but also the inquiries and investigations and the preparation, publication, and distribution of reports in such bureaus as the Census, Corporations, Labor, Manufactures, and Statistics, and of charts in the Coast and Geodetic Survey; the construction and maintenance of more than two hundred ships and boats in the Lighthouse Service, the Coast and Geodetic Survey, and the Fisheries, Navigation, and Immigration Bureaus; the purchase, installation, and maintenance of machinery and instruments, more especially in such bureaus as Standards and the Coast and Geodetic Survey; the maintenance of hatcheries and culture stations under the Bureau of Fisheries; the construction and maintenance of detention stations in the Immigration Service, lighthouses, and aids to navigation; and permanent structures for such bureaus as Standards, Coast and Geodetic Survey, and Fisheries, and the acquisition of the necessary ground for all of them. The work of the Coast and Geodetic Survey and the Bureau of Lighthouses includes the waters of the Philippines, Porto Rico, Hawaii, and Alaska. The Bureau of Fisheries not only has charge of hatcheries and fish-culture stations proper, but exercises general supervision over the salmon interests in Alaska and the seal herds of Bering Sea. And the Immigration Service not only protects the coast and border lines of the United States, but has stations and agents in Alaska, Porto Rico, and Hawaii. The cost of all this work is necessarily increased, because each one of the twelve bureaus must maintain an essentially separate organization, and has to do its work in pursuit of a practically distinct purpose. As is shown in the more detailed discussion following in this report, the pressure for more work in these bureaus has been increasing. So far that demand has been fairly met, but it is apparent that in the future it will not be possible to hold the administration cost of this constantly growing and expanding Department down to the figures of the past four or five years.

RECENT CONSTRUCTIVE LEGISLATION.

It is a matter of particular gratification to report that during this Administration there have been enacted a number of measures of essential importance to the effective organization of several branches of the Department.

BUREAU OF LIGHTHOUSES.

Among these is the law which authorized the organization of the Bureau of Lighthouses. The provisions for an executive head and

for the permanent employment of civilian inspectors has without doubt insured much more satisfactory administration, and has, at the same time, resulted in an estimated annual saving in administration cost alone of several hundred thousand dollars.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

Of even greater importance is the consolidation of the bureaus of Manufactures and Statistics under the appropriate name of "Bureau of Foreign and Domestic Commerce." This action had been recommended by my predecessor upon the strength of a unanimous report submitted to him by a commission appointed to investigate the question. I renewed the recommendation, and this year the necessary legislation was enacted. There is no doubt that this consolidation will result in some economy, and will make possible closer cooperation between the promotion of foreign and domestic commerce, with which one bureau had been charged, and the statistical reports of exports and imports, which were prepared and published by the other. But these benefits are merely incidental. The essential advantage obtained in this reorganization is the acceptance of the principle that the Department of Commerce must be intrusted with all measures that concern the general promotion and regulation of commercial and industrial conditions. In the new bureau is lodged ample authority for this purpose. By proper cooperation with the Consular Service, aided by adequate appropriations, which have so far been lacking, this Bureau will be in a position to provide for our industrial and commercial interests governmental assistance similar to that which the commerce of foreign countries has enjoyed for many years. The organization of the Chamber of Commerce of the United States is a most significant step toward establishing between the governmental agencies and the commercial and industrial world that relation which is absolutely essential to intelligent and effective cooperation.

Finally, it may be noted that the new Bureau has been given authority to "ascertain, at as early a date as possible, and whenever industrial changes shall make it essential, the cost of producing articles at the time dutiable in the United States, in leading countries where such articles are produced, by fully specified units of production, and under a classification showing the different elements of cost, or approximate cost, of such articles of production, including the wages paid in such industries per day, week, month, or year, or by the piece; and hours employed per day; and the profits of manufacturers and producers of such articles; and the comparative cost of living, and the kind of living; what articles are controlled by trusts or other combinations of capital, business operations, or labor, and what effect said trusts, or other combinations of capital, business operations, or labor have on production and prices." With proper appropriations the Bureau is thus in a position to pursue investigations in relation to tariff and similar questions affecting commerce.

REGULATION OF WIRELESS MESSAGES.

Furthermore, important legislation has been enacted for the regulation and control of wireless communications, and in addition Congress has required two wireless operators for every ship carrying 50 persons or more on trips of 200 miles by sea or on the Great Lakes.

THE SEAL TREATY.

Finally, a law has been enacted to carry into effect the seal treaty. This law is in every respect but one framed upon the recommendations of the Department. It is regretted that in one feature the statute departs from these recommendations. During the negotiations this Government insisted upon the position which it had consistently taken for about twenty-five years, that the depletion of the seal herds was to be attributed solely to pelagic sealing, and not in any measure to land killing. The provision in the law for a five-year closed season is, therefore, a substantial repudiation of the earlier position. Between the date of the making of the treaty and its confirmation, and the date of the law, the Government had no experience upon which a reversal of its position could be consistently predicated. Furthermore, observations on the Pribilof Islands during the last season (after pelagic sealing had been suppressed) confirm the position which this Government took in the convention. An actual count shows that the number of breeding seals has been almost doubled. In view of this fact, it is hoped that the statute may be amended in this one respect, so that every cause for the dissatisfaction expressed by two of the countries which participated in the convention may be removed, and that negotiations for further treaties looking to the preservation of sea life may not be discouraged.

GENERAL CONDITION OF THE DEPARTMENT.

Broadly speaking, it is safe to say that the constructive legislation most essential to the proper organization of the Department of Commerce and Labor has been secured. Every bureau is clothed substantially with the necessary authority. Hereafter the work will be measured practically by the appropriations. That these must be largely increased is demonstrated by an examination of the work which is demanded and supplied. The Department is a new one and constitutes the most modern governmental response to the demand for information which the individual citizen can not obtain for himself. That demand will inevitably increase and necessarily the appropriations must keep pace with it.

The statement that each year a considerable sum has been returned to the Treasury unused may create a false impression. These sums could not be used for the particular purposes named in the appropriations, and therefore were not expended. Had these appropriations

been general, the Department would have had difficulty to determine which appeal for assistance had the better right.

In the same connection attention may be called to the need for a readjustment of salaries. Much has been said of a reclassification of the force. What is needed even more is a reclassification of salaries. Really competent men and women are not adequately compensated. Especially in some of the older bureaus, the salaries are based upon conditions that have in every other respect passed into the sphere of historical reminiscence.

SUGGESTIONS FOR FURTHER LEGISLATION

There are, however, some measures of more or less importance which would materially improve the organization of several branches and to which attention must be called.

(*a*) Some months ago a commission was appointed by the joint action of the Treasury Department and the Department of Commerce and Labor to inquire into the subject of statistics of imports and exports. The information about imports is compiled chiefly from the original entries filed by the importers and before these entries are verified by the appraisers and liquidators. With respect to exports the information is quite unreliable, because there is no statute which compels exporters to make returns. The commission has made its report and the recommendations are (1) that the collectors, chiefly the one at New York, be authorized to increase their forces in order that the revision of imports may be promptly made for use in the Bureau of Foreign and Domestic Commerce; and (2) that exporters be compelled by law to make accurate returns so that statistics relating to exports may be promptly and reliably prepared.

(*b*) The trade commission which has been somewhat widely discussed, and for the creation of which a number of bills have been introduced, if created, should, in my judgment, be carefully guarded. If it is well defined, it may serve the general purpose of giving large industrial and commercial concerns much needed Federal authority and control. It is possible that by lodging in the commission well-defined discretion an intelligent purpose may be served. But the obvious danger is that such a commission, once created, will soon be vested with further powers. The disposition will undoubtedly be to give it authority to fix prices and conditions of operation, similar to that which the Interstate Commerce Commission now exercises with respect to railroads and their rates. In other words, there is a strong tendency to disregard the fundamental distinction between a public carrier and a private enterprise.

(*c*) The subject of life-saving equipment and crews on vessels. The general subject of equipment is covered by the new rules issued by the Steamboat-Inspection Service. The same subject has been

investigated by a Senate committee, which is now engaged in formulating legislation based upon its report. The subject of crews, in my opinion, needs attention, as I have pointed out in former reports. But with respect to crews on foreign ships it should be borne in mind that this country has treaties with foreign countries which may be affected by such legislation and which, in some instances at least, embrace other subjects, interference with which may prove embarrassing.

(*d*) The transportation of dangerous articles on vessels, more especially automobiles on ferryboats, should be more carefully guarded than is possible under existing law.
especially automobiles on ferryboats, should be more carefully guarded than is possible under existing law.

(*e*) The sale of publications issued by the Department. The law authorizes the sale of certain publications only. If this provision were extended, publications could be issued in very much larger numbers, demands for them could be readily complied with at comparatively low prices, and the entire operation would be made, in some measure, self-sustaining.

(*f*) Similarly, the Bureau of Foreign and Domestic Commerce should have authority to increase its trade reports. The present limit is 20,000, and that has been reached. Authority to issue a larger number upon condition that a trifling sum be paid for them would enable the Bureau to meet the demand without additional expenditure. No doubt is felt that such a practice would have the approval of commercial bodies.

(*g*) The Bureau of Lighthouses has been reorganized in compliance with the law of 1910. Nearly all the inspectors in the several districts are now civilians. The compensation provided is, however, inadequate, and a very slight increase would make it possible to retain entirely competent men.

(*h*) At present the Commissioner of Labor is a member of the board to arbitrate disputes between railroads and railroad men. The work of the latter position has become so absorbing that some relief should be provided. Either the head of the Bureau of Labor should be relieved of the second position, or he should be furnished with a number of assistants in the Bureau with better compensation than is now allowed. But, in my judgment, the time has come when the law governing these arbitrations should be recast. At present it virtually designates two particular officials to conduct the arbitrations. Obviously these men will in time have to retire, and there is danger that with the retirement of one or both the advantage of the very admirable system which they have built up may be lost. It appears to me that this system should now be utilized and firmly established. Other men should be associated with the work, in order

that they may be familiarized with it in time so as to be in a position to take it up whenever this becomes necessary or desirable. Probably these arbitrations have now reached the point where it will be feasible to create a board of conciliation and arbitration, such a board to be named by the President and confirmed by the Senate.

SUBJECTS OF CONTROVERSY.

The investigation of the Department's administration of the seal herds by the House Committee on Expenditures in the Department of Commerce and Labor, to which reference was made in my last report, has not been formally completed. The resolution of the House calls upon the Secretary for copies of letters, reports and documents, instructions, etc., since January 1, 1904.

Complying with requests of the committee, the Department, at very considerable cost in time and money, furnished copies of all documents called for. The question was suggested whether the committee had authority to compel the attendance of witnesses for the hearing which has been pending for more than one and one-half years. I directed members of the force in the Bureau of Fisheries not to raise this question, but to attend and furnish what information they had. Furthermore, by my direction suggestions were made to the chairman of the committee of persons who by training and experience are qualified to speak upon the subject under investigation, most of them being experts upon whose judgment the Department has relied in deciding upon its course in the management of the seal herds. No report has been made, and the seal treaty as well as the statute to enforce it have in the meantime gone into effect.

Carrying out a suggestion in last year's report, it was provided by rule this year that no seal under 3 years should be killed. The question was regarded as one of economy purely. Since the risk of loss by pelagic sealing has been eliminated, it seems wise to reserve all seals until the skins attain the highest value. Necessarily the number of skins taken this year will be greatly reduced for that reason.

IMMIGRATION.

The administration of this branch of the service has been the subject of less comment than was the case in the previous year. The conditions at most of the ports have been substantially improved; at others the improvements are near completion. Nevertheless, conditions, especially at the New York port, are still unsatisfactory. The quarters are inadequate, and this situation can not be met until larger appropriations are made.

That the general purpose of the law is carried out is made to appear from the percentage of rejections and the number of deportations. That the immigrants admitted represent as good a type as was the case in any recent year is hardly subject to doubt. Private aid societies state that the demand for assistance to newly arrived

aliens has been substantially reduced. The statistical showing that more immigrants receive assistance to come in may safely be accepted as an evidence of greater confidence and corresponding frankness.

Published reports are liable to create a false impression about the character of our immigration. We hear much of those who stop in a few congested cities, and this condition does present a question deserving of serious consideration. We do not, however, hear of those who go into the interior, and who in a few States at least constitute the majority of the farm owners. Furthermore, the fact is overlooked that, for illustration, in the last fiscal year 333,262 aliens departed from this country as compared with 838,172 arrivals. Finally, it is undoubtedly true that the postal savings banks now influence many aliens to keep in this country the savings which they heretofore sent abroad.

The trend to congested centers has been resisted by a vigilant enforcement of the contract-labor clause, while the Division of Information has afforded every proper encouragement to go to the farms.

In one respect, however, there is ground for just complaint. The authorities of several States insist that their eleemosynary institutions have too large a percentage of alien inmates. Although it seems that the larger contribution of these alien inmates was made by immigrants of earlier years, the complaint appears to be well founded even now. Investigation shows that the chief difficulty lies with the system of primary inspection. Admissions upon appeal constitute a relatively small proportion of these inmates. A certain proportion of such mistakes is unavoidable; but it is believed that substantial protection can be secured by strengthening the primary inspection force, especially the medical staff. This situation has been made the subject of a recommendation by the Treasury Department and the Department of Commerce and Labor for an increased appropriation. A larger medical staff, with more alienists and the allowance of more time for examination, would, in all probability, relieve the chief difficulty under which the service now labors in this respect.

It has been the general policy to administer the law strictly to exclude willful offenders, but to use the discretionary authority which the law confers to relieve in cases of mere misfortune. Especial consideration has been given to those cases in which incoming aliens sustain immediate relation to persons already admitted. Such immigrants represent in some degree the rights and interests of persons who have been naturalized or who have acquired a domicile. It is impossible to pass upon the cases of such immigrants regardless of the family relations which attach to them.

The law itself recognizes the propriety of this policy. It provides in terms that when an alien has declared his intention to become a citizen his immigrant wife or children suffering from a contagious

disease shall be admitted, if it is determined that the disorder is easily curable or that they can be admitted to land without danger to other persons. Obviously no medical examiner will assume the responsibility of giving an affirmative certificate that any contagious disease is easily curable or that admission may be granted without danger to other persons. It is, therefore, the accepted policy, for illustration, in cases of trachoma and other similar diseases, to permit detention upon condition that proper hospital treatment without cost to the Government be secured by the execution of a bond.

The law is silent with respect to the families of aliens who are domiciled here but who have not yet filed a declaration of intention to become citizens. Where the intention to remain here has been clearly established, and other conditions have been shown to be favorable, it has also been the policy to detain such contagious cases for treatment, with provision for proper protection against danger and cost.

In a considerable proportion of cases the necessity for ultimate rejection has not been avoided. But it is believed that the readiness to relieve and the success in the greater number of cases does much to inspire the persons immediately concerned with confidence and ready submission to the controlling purpose of the law.

The immigration law is also silent with respect to the foreign-born children of naturalized citizens. The practice had been to regard them as immigrants without claim to special right or consideration. This resulted in the anomalous situation that the foreign-born children of aliens who had merely declared the intention to become citizens received the protection for which the law provides, while the children of naturalized citizens were denied all protection. Still further, while few States provide for the segregated treatment of such diseases as trachoma, naturalized citizens were not even permitted to provide for the treatment of their dependent children in hospitals. Manifestly no such result was intended. An examination of the statutes bearing upon the question has led me to the conclusion that the immigration law was not intended to apply to the minor foreign-born child of a naturalized citizen; but that under the naturalization statute such child is in a position, by taking up residence in this country, to perfect the inchoate right of citizenship which has been created for it by the naturalization of the father. The law says that the naturalization of an alien shall confer citizenship upon his minor children, provided that this citizenship shall not begin until the child begins its residence in this country. Properly speaking, these children do not belong to the immigrant class. This conclusion, it is true, is in conflict with the decisions of several courts, relying upon a decision of the United States Supreme Court. Since that decision was rendered, the naturalization law has, however, been so amended that, in my judgment, the conclusion reached

by me can not be avoided. Furthermore, the importance of the question is greatly overestimated with respect to the number of persons who are affected by the ruling.

Generally speaking, it has seemed to me that where aliens come to join a family established in this country a liberal policy is properly applied. The physical condition of incoming aliens is of course of great importance, but so is the confidence and good will of those who have already been accepted. The increased cost is inconsiderable, especially when it is remembered that the head tax collected from immigrants during the last fiscal year exceeded the entire appropriation for the Immigration Service for the same year by $280,264.

A more detailed discussion of the work of the several Bureaus follows.

OFFICE OF THE SECRETARY.

OFFICE OF THE CHIEF CLERK.

NEW BUILDING.

Congress at its last session approved the Department's recommendation for the enactment of a law giving the head of the Department authority to enter into a five-year lease for a building sufficiently large to take care of all of those branches of the Department in the District of Columbia now in rented quarters, except the Bureau of the Census. The Department has accepted an offer to erect a building which it is expected will be delivered not later than September 1 of next year and which it is believed may be occupied until the new Government building is erected. The loss of efficiency in administration due to the fact that the bureaus which will go into this building are now occupying three entire buildings and parts of three other buildings, all at different locations, is very much greater than might appear. This situation will now be corrected, as will also other equally important conditions, such as lack of proper light and ventilation and unsatisfactory protection of employees and property against the danger of fire. In fact, the effort to obtain a modern sanitary building was undertaken primarily because it was desired to remedy as soon as possible the unsatisfactory conditions under which many of the employees are required to labor.

LABOR-SAVING MACHINERY.

The introduction of labor-saving devices of many kinds throughout the Department has been uniformly encouraged. Machines for making photographic reproductions of letters and documents have been installed for the purpose of saving the time of typewriters. Dictating machines have been provided in a number of offices for the purpose of saving the time of correspondence clerks and stenographers, and computing machines of various kinds have been purchased whenever it has been found that they could be used to ad-

vantage. A mechanical section has been installed in the Division of Publications for duplicating circular letters, notices, etc. The large number of adding machines in the possession of the Bureau of the Census has afforded an opportunity for considerable saving in other branches of the Department, as many of these machines have been distributed where they could be used to advantage, instead of buying new machines. It is thought that the actual deterioration in these machines through moderate use will not be appreciably greater than the deterioration that would result from mere idleness.

PURCHASE OF SUPPLIES.

Much delay and confusion in the purchase of supplies has been occasioned during the past few months by the more strict enforcement of the law relating to such purchase (sec. 4 of the act of June 17, 1910), under recent decisions of the accounting officers. No criticism of these decisions is intended, but the sudden change from a rather loose to a strict construction of the law resulted in an appreciable increase in the details attendant upon the purchase and distribution of supplies. It is quite apparent that the law referred to ought to be amended. While it is undoubtedly true that the General Supply Committee, established by this law, has justified its creation, it may be suggested that the jurisdiction of this committee now includes purchases that were not contemplated. It has been urged that the annual schedule of supplies, which contains all those articles for which contracts are made by the Secretary of the Treasury upon the recommendation of the General Supply Committee, now includes articles which apparently are not common to the needs of two or more departments as required by the law. Great advantage undoubtedly results from a central contracting agency for all articles that are in fact common to the needs of the departments, but on the other hand there would be a disadvantage in the inclusion in the general supply schedule of articles which are needed for special purposes only.

The decisions of the accounting officers referred to above have raised the doubt in the mind of purchasing officers whether they have the authority to purchase a particular article not actually named in the schedule except through the Secretary of the Treasury. Resolving the doubt in such manner as to be on the safe side and to avoid the possible suspension of accounts, the Secretary of the Treasury has been asked to include in the supply schedule articles that are not strictly common to the needs of the several departments. The result is that the supply schedule has a tendency to grow to proportions which were probably not anticipated by the framers of this legislation.

The remedy for this condition would seem to be to so amend the law as to make it clear that the heads of departments retain the right to purchase independently of the general schedule such articles as

are needed to meet special needs. In this way there is greater certainty that the Department will get an article of the exact quality desired, and there is also appreciably less expense and delay involved in the steps leading up to the purchase.

The advantage of a central purchasing agency for supplies that are common to the needs of the departments in Washington, in addition to the contracting agency which is now authorized, is suggested. It is believed that such an agency would result both in a substantial saving in clerk hire and in the rental cost of space now occupied by numerous supply divisions and storage and distributing agencies, and in a reduction in the prices of articles purchased. On the other hand, any attempt to include in such a system the purchase of supplies of a special character would probably result in loss of time and money.

It has also been suggested that some central Government agency ought to make contracts for the delivery at the more important seaports of the United States of supplies that are used by the ships in the service of the Government. This is a subject of some importance, and it seems at least worthy of serious consideration.

PERSONNEL.

This subject is appropriately considered in detail in the annual report of the Chief of the Appointment Division, but the Chief Clerk of the Department is charged by law with general supervision over all clerks and other employees of the Department, and in that connection a few general observations may not be out of place here.

However carefully laws and regulations may be drafted, neither will ever secure the most essential qualification of a good employee. No order will create esprit de corps. The interest and good will of the force depend largely upon the confidence which it entertains for its Chief in the Bureau or the Department. It has been the policy therefore to refrain wherever possible from the issuance of detailed rules and regulations to cover matters of relatively small importance, and to inspire confidence by extending it. It is believed that this policy has been justified by experience, and that as a general rule the employees of this Department have shown more than the usual devotion to the performance of their duties.

Perhaps the chief defect in the present practice is to be found in the system of promotion. This defect is not inherent, but it must be admitted that employees lack complete confidence in the results; and of course no system can be said to be entirely satisfactory that does not command confidence. Many remedies may be suggested. Efficiency ratings have been tried in this Department with a fair degree of success, and are now required by law to be established by the Civil Service Commission. But no system can eliminate the personal equation altogether. The difficulties in the way of the establishment

of a system of promotion which will result in the promotion in each instance of the person who is the most efficient in the grade and at the same time command the confidence of the persons to whom it applies, has led to the suggestion that we should confine ourselves to weeding out the inefficient at the end of the probationary period and thereafter promote, within certain well-defined limits, as do some large business establishments, by seniority. Without committing the Department to the conclusion that this plan ought to be adopted, it seems at least worthy of consideration.

At present the probationary period provided by the civil-service rules amounts to very little. At the end of the probationary term it is virtually decided whether the employee is worth retaining at the salary he is receiving at that particular moment. This is manifestly wrong. The decision should not only determine whether he is worth keeping at the particular salary he is then receiving, but whether he is worth retaining and developing for more important purposes. If a more strict probationary term should be enforced, the inefficient would not receive absolute appointment, and the rule of seniority in promotion with proper limitations as to the maximum grade would not have the tendency to eventually fill the high grades with those of relatively low efficiency.

It has not been suggested that the seniority rule should apply to positions requiring special qualifications. In these positions appointment may be made from the register or promotion may be made from the clerical grades as a result of competitive examination or as at present. In the latter case the personal equation is of course again introduced; but a proper system of efficiency ratings based upon the record of work actually performed would at least minimize this factor, and taking the service as a whole its possible effect upon the destiny of the employee would be substantially reduced.

On the other hand, there should be no restrictions upon the power to reduce an employee who falls below a certain standard; and this standard should be sufficiently high to insure against the indifference that might otherwise attend an arbitrary plan of promotion.

Finally, the need for some plan to relieve the service of superannuation, which is discussed elsewhere in this report, is real. The need for a system which will prevent or at least diminish the occurrence of superannuation is just as real. This difficulty may be at least partially met by a revision of the age limits at which persons may enter the classified service. Under the present civil-service rules an age limit applies to some positions but not to others. This seems unwise. It is obvious that if persons of advanced years are accepted in the civil service, superannuation must soon result. On the other hand, if selection for the main body of clerks is limited to young persons, the proportion of superannuation is necessarily reduced.

DISBURSING OFFICE.

The itemized statement of the disbursements from the contingent fund of the Department of Commerce and Labor and the appropriation for "General expenses, Bureau of Standards," for the fiscal year ended June 30, 1912, required to be submitted to Congress by section 193 of the Revised Statutes of the United States, the itemized statement of expenditures under all appropriations for propagation of food fishes during the fiscal year ended June 30, 1912, required by the act of Congress approved March 3, 1887 (24 Stat., 523), and a statement showing travel on official business by officers and employees (other than the special agents, inspectors, and employees in the discharge of their regular duties, who are required to travel constantly) from Washington to points outside of the District of Columbia during the fiscal year ended June 30, 1912, as required by the act of Congress approved May 22, 1908 (35 Stat., 244), will be transmitted to Congress in the usual form.

APPROPRIATIONS.

The following table shows the total amounts of all annual appropriations for the various bureaus and services of the Department of Commerce and Labor for the fiscal year ended June 30, 1912, of all appropriations made for public works in the various services of the Department which, under the law, may be disbursed without regard to any particular year, and of all permanent, indefinite, and deficiency appropriations:

Object of appropriation.	Annual appropriations, 1912.	Appropriations for public works.	Permanent indefinite appropriations.	Total.
Office of the Secretary of Commerce and Labor.	$283,900.00			$283,900.00
Bureau of Corporations	254,200.00			254,200.00
Bureau of Manufactures	106,600.00			106,600.00
Bureau of Labor	[1] 191,090.00			191,090.00
Bureau of Statistics	77,650.00			77,650.00
Bureau of Standards	436,340.00	$75,000.00		511,340.00
Bureau of Navigation	56,280.00			56,280.00
Shipping Service	75,750.00			75,750.00
Refunding penalties or charges erroneously exacted			$4,642.72	4,642.72
Refunding moneys erroneously received			50.00	50.00
Bureau of Immigration and Naturalization	2,837,500.00	435,700.00		3,273,200.00
Steamboat-Inspection Service	534,740.00		8,892.51	543,632.51
Bureau of Fisheries	922,490.00	210,500.00		1,132,990.00
Bureau of Lighthouses	5,037,410.00	985,950.00		6,023,360.00
Bureau of the Census	[2] 2,000,000.00			2,000,000.00
Coast and Geodetic Survey	1,005,120.00			1,005,120.00
Allotment for printing and binding	375,000.00			375,000.00
Total	[3] 14,194,070.00	1,707,150.00	13,585.23	15,914,805.23

[1] Includes special appropriation of $20,000.
[2] Special appropriation.
[3] Includes special appropriations amounting to $2,020,000.

DISBURSEMENTS.

The disbursements by the Disbursing Clerk of the Department of Commerce and Labor during the fiscal year ended June 30, 1912, arranged according to items of appropriation, are as follows:

OFFICE OF THE SECRETARY.

Salaries, Office of Secretary of Commerce and Labor, 1911	$6,863.50
Salaries, Office of Secretary of Commerce and Labor, 1912	163,641.00
Contingent expenses, Department of Commerce and Labor, 1910	171.76
Contingent expenses, Department of Commerce and Labor, 1911	19,354.21
Contingent expenses, Department of Commerce and Labor, 1912	59,616.96
Rent, Department of Commerce and Labor, 1911	3,972.16
Rent, Department of Commerce and Labor, 1912	43,630.28
Total	297,249.87

BUREAU OF CORPORATIONS.

Salaries, Bureau of Corporations, 1911	3,456.51
Salaries, Bureau of Corporations, 1912	70,801.80
Salaries and expenses, special attorneys, examiners, etc., Bureau of Corporations, 1911	6,039.73
Salaries and expenses, special attorneys, examiners, etc., Bureau of Corporations, 1912	126,958.92
Total	207,256.96

BUREAU OF MANUFACTURES.

Salaries, Bureau of Manufactures, 1911	1,518.38
Salaries, Bureau of Manufactures, 1912	34,758.95
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1911	285.64
Salaries and expenses, commercial agents, Department of Commerce and Labor, 1912	790.67
Collating tariffs of foreign countries, 1911	378.94
Collating tariffs of foreign countries, 1912	8,820.68
Total	46,553.26

BUREAU OF LABOR.

Salaries, Bureau of Labor, 1911	4,395.19
Salaries, Bureau of Labor, 1912	96,942.17
Miscellaneous expenses, Bureau of Labor, 1910	500.00
Miscellaneous expenses, Bureau of Labor, 1911	8,010.03
Miscellaneous expenses, Bureau of Labor, 1912	77,626.39
Library, Bureau of Labor, 1911	165.13
Library, Bureau of Labor, 1912	915.60
Medical examination of injured employees, 1912	160.34
Total	188,714.85

STEAMBOAT-INSPECTION SERVICE.

Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1911	601.69
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1912	13,897.19

Salaries, Steamboat-Inspection Service	$35,483.53
Salaries, Steamboat-Inspection Service, 1912	315,865.20
Contingent expenses, Steamboat-Inspection Service	14,057.20
Contingent expenses, Steamboat-Inspection Service, 1912	65,152.43
Clerk hire, Steamboat-Inspection Service, 1912	75,114.05
Total	520,171.29

BUREAU OF STATISTICS.

Salaries, Bureau of Statistics, 1911	2,833.87
Salaries, Bureau of Statistics, 1912	70,215.56
Collecting statistics relating to commerce, 1911	254.59
Collecting statistics relating to commerce, 1912	3,648.40
Total	76,952.42

BUREAU OF NAVIGATION.

Salaries, Bureau of Navigation, 1911	1,311.71
Salaries, Bureau of Navigation, 1912	31,136.36
Salaries, Shipping Service	5,684.10
Salaries, Shipping Service, 1912	28,012.97
Clerk hire, Shipping Service, 1912	29,882.34
Contingent expenses, Shipping Service, 1911	1,265.57
Contingent expenses, Shipping Service, 1912	7,797.55
Enforcement of wireless-communication laws, 1912	6,104.49
Instruments for measuring vessels and counting passengers, 1911	90.00
Instruments for measuring vessels and counting passengers, 1912	48.51
Enforcement of navigation laws, 1912	6,996.14
Total	118,329.74

BUREAU OF STANDARDS.

Salaries, Bureau of Standards, 1911	8,153.43
Salaries, Bureau of Standards, 1912	214,554.43
Equipment, Bureau of Standards, 1910	2,547.72
Equipment, Bureau of Standards, 1911	3,946.64
Equipment, Bureau of Standards, 1912	41,455.75
General expenses, Bureau of Standards, 1910	7.19
General expenses, Bureau of Standards, 1911	1,842.04
General expenses, Bureau of Standards, 1912	22,075.19
Improvement and care of grounds, Bureau of Standards, 1911	592.92
Improvement and care of grounds, Bureau of Standards, 1912	2,574.52
Laboratory, Bureau of Standards	70,141.80
Testing machine, Bureau of Standards	16,724.13
Testing machines, Bureau of Standards, 1912	26,219.71
Testing machine at Pittsburgh, Bureau of Standards	21,916.35
Weights and measures, Bureau of Standards, 1910–1911	1,606.05
Investigating effects of electric currents, Bureau of Standards, 1911	3,237.65
Investigating effects of electric currents, Bureau of Standards, 1912	13,138.43
Testing structural materials, Bureau of Standards, 1911	2,808.72
Testing structural materials, Bureau of Standards, 1912	68,167.90
Total	521,710.57

BUREAU OF IMMIGRATION AND NATURALIZATION.

Salaries, Bureau of Immigration and Naturalization, 1911	$5,667.66
Salaries, Bureau of Immigration and Naturalization, 1912	127,820.00
Expenses of regulating immigration, 1909, and prior years	723.85
Expenses of regulating immigration, 1910	1,714.27
Expenses of regulating immigration, 1911	304,400.28
Expenses of regulating immigration, 1912	2,328,102.99
Expenses of regulating immigration (special fund)	14,055.37
Expenses of regulating immigration, 1910–11	19,766.73
Immigrant station, Ellis Island, N. Y	80,171.85
Immigrant station, Boston, Mass	30,225.00
Immigrant station, Galveston, Tex	57,320.61
Immigrant station, Charleston, S. C	30,677.52
Immigrant station, New Orleans, La	29,692.43
Immigrant station, Philadelphia, Pa	78,048.45
Miscellaneous expenses, Division of Naturalization, 1911	13,803.79
Miscellaneous expenses, Division of Naturalization, 1912	156,631.44
Ferry steamer, Immigration Service, San Francisco, Cal	46,110.01
Payment of fees to Austrian seamen detained at Ellis Island, N. Y	1,040.00
Total	3,325,972.25

BUREAU OF FISHERIES.

Salaries, Bureau of Fisheries, 1911	22,313.66
Salaries, Bureau of Fisheries, 1912	329,205.01
Miscellaneous expenses, Bureau of Fisheries, 1910	.45
Miscellaneous expenses, Bureau of Fisheries, 1911	45,210.63
Miscellaneous expenses, Bureau of Fisheries, 1912	338,328.91
Salaries, agents at salmon fisheries in Alaska, 1911	179.17
Salaries, agents at seal fisheries in Alaska, 1911	4,546.59
Protecting seal fisheries of Alaska	3,534.61
Protecting seal and salmon fisheries of Alaska, 1911–1912	65,054.10
Biological station, Mississippi River Valley	21,985.26
Marine biological station, Florida	233.34
Marine biological station, North Carolina	1,196.74
Protecting the sponge fisheries, 1912	84.40
Steamer Fish Hawk, repairs	19,809.00
Fish hatcheries:	
Alaska	91.70
Green Lake, Me	261.62
Kentucky	322.24
Lake County, Colo	5,288.10
Mammoth Spring, Ark	88.55
Puget Sound, Wash	13,993.12
South Carolina	93.34
Upper Mississippi River Valley	11,019.58
Vermont	3,581.92
Wyoming	53.30
Total	886,475.34

BUREAU OF LIGHTHOUSES.

Salaries, Bureau of Lighthouses, 1911	2,730.89
Salaries, Bureau of Lighthouses, 1912	61,135.38

Salaries, Lighthouse Service, 1912	$53,160.58
Salaries, lighthouse vessels, 1912	190,796.64
Salaries, keepers of lighthouses, 1912	134,567.86
General expenses, Lighthouse Service, 1912	286,023.63
Supplies of lighthouses, 1911	7,430.65
Repairs, etc., of lighthouses, 1911	5,756.27
Expenses of buoyage, 1911	5,347.70
Expenses of light vessels, 1911	2,389.93
Maintenance of lighthouse tenders, 1911	2,359.17
Repairs to lighthouse tenders, 1911	303.65
Repairs of light vessels, 1911	6,501.72
Lighting of rivers, 1911	1,050.74
Expenses of fog signals, 1911	7,893.10
Point Abino Light Vessel, Lake Erie	1,392.17
Frying Pan Shoal Light Vessel, N. C	9,536.54
Milwaukee Light Vessel, Wis	12,245.04
Relief Light Vessel, ninth and eleventh lighthouse districts	15,571.48
Tender for inspector, eighth lighthouse district	7,676.04
Tender for first lighthouse district	836.29
Tender for engineer, sixth lighthouse district	57.50
Eagle Point range lights, N. J	2,653.30
Cape Fear River lights, N. C	5,029.30
Edgemoor Lighthouse Depot, Del	9,853.36
Staten Island Lighthouse Depot, N. Y	10,958.39
Miah Maul Shoal Light Station, Del	379.20
Buffalo Breakwater North End Light Station, N. Y	58.75
Monhegan Island Light Station, Me	314.88
Thimble Shoal Light Station, Va	5.50
Lloyd Harbor Light Station, N. Y	263.02
Ambrose Channel Buoys, N. Y	2,400.00
Storehouses for oil	1.09
Total	846,679.76
Grand total	7,036,066.31

The following statement shows the expenditures during the fiscal year ended June 30, 1912, on account of all appropriations under the control of the Department of Commerce and Labor, giving the total amounts disbursed by the various disbursing officers of the Department and miscellaneous receipts for the same period:

By the Disbursing Clerk, Department of Commerce and Labor, on account of salaries and expenses of the Office of the Secretary of Commerce and Labor, the Bureaus of Corporations, Manufactures, Labor, Statistics, Navigation, Immigration and Naturalization, Standards, Fisheries, and Lighthouses, the Office of the Supervising Inspector General, Steamboat-Inspection Service, expenses of regulating immigration, salaries and expenses of Steamboat-Inspection Service at large, and public works of the Immigration and Fisheries Services (shown in detail in foregoing table of disbursements)	$7,036,066.31
By the authorized disbursing officers of the Lighthouse Service	4,358,499.50

By the special disbursing agent, Coast and Geodetic Survey, on account of salaries and expenses of the Coast and Geodetic Survey		$916,079.19
By the disbursing clerk, Bureau of the Census, on account of salaries and expenses of the Bureau of the Census		2,333,458.25
By the special disbursing agents of the Immigration Service		12,130.68
By the special agents of the Department investigating trade conditions abroad, as special disbursing agents		48,349.16
By special disbursing agents, Bureau of Fisheries		35,995.47
By customs officers on account of witnesses' fees in steamboat investigations		342.65
By warrants drawn on the Treasurer of the United States to satisfy accounts settled by the Auditor for the State and other Departments, classified as follows:		
Office of the Secretary	$1,108.20	
Bureau of Corporations	.40	
Bureau of Manufactures	1,114.80	
Bureau of Labor	1.00	
Bureau of Standards	4,455.33	
Steamboat-Inspection Service	3,858.21	
Bureau of Navigation	5,403.17	
Bureau of Immigration and Naturalization	47,072.55	
Bureau of Fisheries	22,541.39	
Bureau of Lighthouses	163,754.58	
Bureau of the Census	167,931.45	
Coast and Geodetic Survey	14,855.87	
		[1] 432,096.95
Total		15,173,018.16

MISCELLANEOUS RECEIPTS REMITTED TO THE TREASURY IN ACCORDANCE WITH LAW, FISCAL YEAR 1912.

Coast and Geodetic Survey:	
Sale of Charts, Coast Pilots, and Tide Tables	$14,315.82
Sale of property, outside work, etc	1,190.76
Bureau of Standards: Standardizing and testing weights, etc	12,690.34
Bureau of Immigration and Naturalization:	
Head tax	3,319,804.00
Exclusive privileges	14,306.33
Naturalization fees	204,639.50
Court costs	26.57
Fines	25,987.00
Telephone rentals and sale of ice	1,958.75
Bureau of Navigation: Navigation fees	147,768.82
Bureau of Fisheries:	
Sale of sealskins	385,862.28
Sale of fox skins	15,096.58
Sale of property, Pribilof Islands	8,603.70
Bureau of the Census:	
Transcripts of census records	1,068.32
Sale of publications	499.10
Sale of Government property	126.00

[1] This sum includes $36,137.52 reimbursed to "Contingent expenses, Department of Commerce and Labor," on account of supplies furnished to the different Bureaus of the Department.

Bureau of Lighthouses: Sale of condemned property, rentals, etc.	$12,812.62
Proceeds of sale of condemned property, exclusive of the Bureau of Lighthouses	12,004.65
	4,178,761.14
Other receipts:	
Tonnage tax	1,156,010.75
Annual yacht tax	8,768.34
Total	5,343,540.23

BALANCES OF APPROPRIATIONS.

The following unexpended balances of appropriations were turned into the surplus fund June 30, 1912, in accordance with the act of June 20, 1874 (18 Stat., 110–111):

Salaries, Office of Secretary of Commerce and Labor, 1910	$4,514.39
Salaries and expenses, special agents, Department of Commerce and Labor, 1909	1.52
Salaries and expenses, special agents, Department of Commerce and Labor, 1910	7,489.57
Rent, Department of Commerce and Labor, 1910	2,342.52
Contingent expenses, Department of Commerce and Labor, 1910	33.61
Investigating the condition of woman and child workers, 1909–10	3.54
Salaries, Bureau of Corporations, 1910	2,782.62
Salaries and expenses, special attorneys, examiners, etc., Bureau of Corporations, 1910	48,754.10
Salaries, Bureau of Manufactures, 1910	1,077.44
Collating tariffs of foreign countries, 1910	1,238.54
Ferry steamer, Immigrant Service, San Francisco, Cal., special fund	2,308.82
Ellis Island Immigrant Station	455.93
Ellis Island Immigrant Station, 1910	1,195.47
Salaries, Bureau of Labor, 1910	3,454.84
Miscellaneous expenses, Bureau of Labor, 1910	379.05
Library, Bureau of Labor, 1910	18.55
Salaries, Bureau of Standards, 1910	4,818.99
Equipment, Bureau of Standards, 1910	228.94
General expenses, Bureau of Standards, 1910	228.09
Gaslight standards, Bureau of Standards, 1910	44.90
Improvement and care of grounds, Bureau of Standards, 1910	36.37
Weights and measures, Bureau of Standards, 1910	2,370.10
Salaries, keepers of lighthouses, 1910	139,563.39
Preliminary expenses of the Thirteenth Census, 1909–10	1,890.75
Salaries, Coast and Geodetic Survey, 1910	8,929.19
Party expenses, Coast and Geodetic Survey, 1909-10	9,310.51
Party expenses, Coast and Geodetic Survey, 1910	11,830.64
General expenses, Coast and Geodetic Survey, 1910	459.34
Pay, etc., of officers and men, vessels, Coast Survey, 1910	16,725.15
Repairs of vessels, Coast Survey, 1910	189.85
Salaries, Bureau of Fisheries, 1910	15,029.90
Miscellaneous expenses, Bureau of Fisheries, 1909	12.45

Miscellaneous expenses, Bureau of Fisheries, 1910	$13,523.03
Fish hatcheries, Alaska	138.37
Lake County, Colo., fish hatchery	55.83
Mammoth Springs, Ark., fish hatchery	56.17
Vermont fish hatchery	10.30
Supplies for native inhabitants of Alaska, 1910	424.91
Repairs to public buildings, Pribilof Islands, Alaska, 1910	14.38
Salaries, Bureau of Immigration and Naturalization, 1910	4,543.29
Expenses of regulating immigration, 1910	3,286.79
Special examiners, etc., Division of Naturalization, 1910	17,973.32
Additional assistants to clerks of courts in naturalization cases, 1910	16,401.08
Salaries, Bureau of Navigation, 1910	311.39
Contingent expenses, Shipping Service, 1910	4,090.17
Supplies of lighthouses, 1909	138.10
Supplies of lighthouses, 1910	16,472.06
Repairs and incidental expenses of lighthouses, 1909	175.00
Repairs and incidental expenses of lighthouses, 1910	24,238.57
Expenses of light vessels, 1910	62,493.09
Lighting of rivers, 1910	13,263.83
Salaries, Bureau of Statistics, 1910	873.36
Collecting statistics relating to commerce, 1910	22.33
Salaries, Office of Supervising Inspector General, Steamboat-Inspection Service, 1910	46.66
Salaries, Bureau of Lighthouses, 1910	1,344.60
Expenses of buoyage, 1910	32,314.73
Expenses of fog signals, 1910	23,339.55
Porto Rican lighthouse service	3,878.13
Guantanamo lighthouse service	1,791.20
Ambrose Channel Bend range lights, N. Y	12,000.00
Bellevue range lights, Delaware River	4,693.28
Goose Island Flats lights, Del	2,875.21
Neebish Channel lights, St. Marys River, Mich., 1910	494.58
St. Johns River lighted buoy, Fla	13,478.00
South East Shoal, Lake Erie, Light Vessel, 1910	277.78
Third lighthouse district, tender for	3,991.84
Inspector, sixth lighthouse district, tender for	5,152.68
Seventh lighthouse district, tender for	7,790.90
Twelfth lighthouse district, tender for	1,616.98
Thirteenth lighthouse district, tender for	2,995.48
Pacific Ocean, tender for	259.52
Porto Rico, tender for	13,849.17
Lake Superior, tender for	1,375.12
Fort San Jacinto, Tex., Lighthouse Depot	1,122.66
Duluth Harbor North Pier, Minn., Light Station	170.83
Honolulu Harbor, Hawaii, Light Station	1.45
Molokai, Hawaii, Light Station	3.63
Rock of Ages, Mich., Light Station	1,671.50
Total	602,759.92

APPOINTMENT DIVISION.

POSITIONS IN THE DEPARTMENT.

The accompanying table shows by bureaus the positions in the Department on August 24, 1912,[1] and the increase or decrease in each bureau as compared with July 1, 1911. The figures do not include the following employments, appointment to which is not made by the Secretary: Crews on vessels in the Coast and Geodetic Survey, which consist of 367 employments, 156 of which were filled by persons paid by the insular government of the Philippine Islands; employments of persons in rodding, chaining, recording, heliotroping, etc., in field parties of the Survey, of which there were 1,308; temporary employments in the field operations of the Bureau of Fisheries, of which there were 3,868; emergency employments of guards, interpreters, stenographers, etc., in the field service of the Bureau of Immigration and Naturalization, of which there were 1,332; and mechanics, skilled tradesmen, laborers, etc., employed in field construction work in the Lighthouse Service, of which there were 2,765; nor do they include certain other employments, such as clerks of courts, collectors and surveyors of customs, etc., aggregating 2,956, connected with other services of the Government, and employed occasionally in connection with the work of this Department. The total miscellaneous employments not included is 12,596.

Bureau.	Statutory.	Nonstatutory.	Total.	In District of Columbia.	Outside District of Columbia.	Increase (+) or decrease (−).
Office of the Secretary	158	.....	158	158	.....	− 3
Bureau of Corporations	64	65	129	[2] 129	.....	+ 2
Bureau of Labor	71	22	93	[2] 93	.....	− 4
Bureau of Lighthouses	59	5,057	5,116	45	5,071	[3]−339
Bureau of the Census	610	725	1,335	[2] 641	694	−165
Coast and Geodetic Survey	246	98	344	[2] 261	83	− 9
Steamboat-Inspection Service	194	68	262	9	253	− 1
Bureau of Fisheries	388	9	397	82	315	+ 19
Bureau of Navigation	42	40	82	24	58	+ 5
Bureau of Immigration and Naturalization	100	1,558	1,658	105	1,553	+ 20
Bureau of Standards	193	87	[4] 280	235	45	+ 16
Bureau of Foreign and Domestic Commerce	83	12	95	89	6	[5]− 5
Children's Bureau	15	.....	15	15	.....	+ 15
Total	2,223	7,741	9,964	1,886	8,078	[6]−449

[1] The status of positions is shown as of August 24, 1912, for the reason that the legislative, executive and judicial and the sundry civil appropriation acts were not approved until August 23 and 24, respectively. The status of positions in the Department on July 1, 1912, was substantially the same as shown in the table for July 1, 1911.

[2] Employees engaged in work in the field for a part of each year with headquarters in Washington are treated as within the District of Columbia.

[3] Decrease is due to the discontinuance of mechanics, laborers, etc., who are now included in the employments under field construction work, and to the discontinuance of officers and crews of vessels now out of commission.

[4] Does not include 5 members of the visiting committee.

[5] Decrease in positions reported last year for the Bureaus of Manufactures and Statistics, consolidated by operation of law into the Bureau of Foreign and Domestic Commerce.

[6] Decrease 526, increase 77, leaving a net decrease of 449, against a net increase of 155 in the fiscal year 1911.

PRESIDENTIAL APPOINTMENTS.

During the fiscal year and up to October 1, 1912, 21 appointments were made to presidential positions. In each instance selection was made on the basis of ascertained or demonstrated fitness rather than political considerations. It is interesting to note that of the 21 appointments made 16 appointees were taken from or had been in the classified service. Of the remaining 5, 3 appointments were made of persons from outside the service because competent ones could not be found within it who would accept service in Alaska and 2 were of persons who were highly recommended because of their well-known qualifications.

CHANGES IN THE PERSONNEL.

The following tables give a summary of the changes in the personnel of the Department during the fiscal year. The figures do not include changes in the Thirteenth Decennial Census force.

APPOINTMENTS.[1]

Bureau.	Permanent.				Temporary.	Total.
	Competitive.	Excepted.	Unclassified.	Total.		
Office of the Secretary	49	.....	8	57	12	69
Bureau of Manufactures	10	14	.....	24	1	25
Bureau of Corporations	17	1	.....	18	4	22
Bureau of Labor	6	.....	.....	6	33	39
Bureau of Lighthouses	320	39	.....	359	121	480
Bureau of the Census	20	1	.....	21	4	25
Coast and Geodetic Survey	43	4	.....	47	16	63
Bureau of Statistics	9	.....	.....	9	3	12
Steamboat-Inspection Service	20	.....	1	21	3	24
Bureau of Fisheries	42	6	16	64	5	69
Bureau of Navigation	17	1	.....	18	12	30
Bureau of Immigration and Naturalization	157	59	38	254	99	353
Division of Naturalization	26	.....	.....	26	23	49
Bureau of Standards	82	.....	6	88	50	138
Total	818	125	69	1,012	386	1,398

[1] Includes appointments under Executive orders, reinstatements, transfers within the Department, and transfers to the Department from other departments or independent offices.

SEPARATIONS AND MISCELLANEOUS CHANGES.

Bureau.	Separations.[1]						Miscellaneous changes.[2]
	From permanent positions.				From temporary positions.	Total.	
	Competitive.	Excepted.	Unclassified.	Total.			
Office of the Secretary	26		5	31	9	40	56
Bureau of Manufactures	6	5		11		11	11
Bureau of Corporations	19			19	3	22	70
Bureau of Labor	10			10	21	31	48
Bureau of Lighthouses	401	19		420	125	545	692
Bureau of the Census	91		5	96	108	204	88
Coast and Geodetic Survey	45	3		48	18	66	162
Bureau of Statistics	4			4	6	10	21
Steamboat-Inspection Service	22	1	1	24	2	26	36
Bureau of Fisheries	35	2	13	50	6	56	91
Bureau of Navigation	9			9	13	22	49
Bureau of Immigration and Naturalization	127	41	29	197	128	325	557
Division of Naturalization	14			14	26	40	101
Bureau of Standards	46		6	52	48	100	205
Total	855	71	59	985	513	1,498	2,187

[1] Includes separations by removals without prejudice or on charges, resignations, deaths, discontinuances of probationary appointees, by transfer within the Department, or from the Department to other departments or independent offices.

[2] Includes promotions; reductions; changes of appropriation, designation, name, or station; and cancellations of appointment certificates, etc.

PERSONNEL OF THE BUREAU OF THE CENSUS.

The following table shows the number of appointments to and separations from the temporary Thirteenth Census roll during the fiscal year:

Positions.	Appointments.	Separations.
Special agents	[1] 1,471	859
Clerks	[2] 4	1,965
Not exceeding 60 days	36	36
Subclerical employees	[3] 4	65
Not exceeding 60 days	4	4
Total	1,519	2,929

[1] Includes 668 cotton agents reappointed on piece-price basis.

[2] By reinstatement.

[3] By change in grade.

During the last session of Congress the Bureau felt obliged to ask for an urgent deficiency appropriation in order to carry on its work to the end of the fiscal year, but as Congress granted only one-half of the amount requested it became necessary to take immediate steps looking toward a heavy reduction in the temporary force and the curtailment of expenses in other ways. Between December 31, 1911, and February 29, 1912, practically all employees remaining on the temporary Thirteenth Census roll were separated from the service. Among the persons dismissed were many on whom a severe hardship was imposed, most of them having expected to remain considerably longer in the service. With a view to assisting those who had taken civil-service examinations for the departmental service at large, the Department suggested to the President, who promptly took action in accordance therewith, that in the consideration of eligibles certified by the Civil Service Commission the head of each executive department and independent establishment be asked to give such special consideration to the persons who obtained satisfactory efficiency ratings while engaged in census work, and whose services were dispensed with by reason of the failure of appropriation, as the law of apportionment and the law according preference to persons honorably discharged from the military or naval service would permit. It also requested the chiefs of its various bureaus and offices to give similar consideration to this class of employees if their names were certified by the Commission. At the close of the fiscal year 31 of the former clerks had been appointed in this Department, 9 had declined appointment, and a few failed to respond to the notices of selection. Quite a number have since been appointed to permanent positions in the Bureau of the Census, and others will be so appointed from time to time, under the provisions of the legislative, executive, and judicial act approved August 23, 1912, which requires that preference in appointment be given to such census employees as have passed the civil-service examinations and had at least one year's experience in census work. Also 175 have been temporarily appointed under the provisions of the same act.

It also became necessary to dispense promptly with the services of those persons who were transferred to the Bureau under the fifth proviso of section 7 of the Thirteenth Census Act to serve during the decennial census period. The Department accordingly called the attention of the departments and the Government Printing Office, from which these employees had been transferred, to the fact that it would be necessary to terminate their services in the Bureau, either by transfer or by furlough without pay, not later than February 29, 1912, and expressed the hope that the applications of those who desired retransfers would be looked upon favorably. It is gratifying to be able to state that of the 27 persons concerned 25 have been provided for.

TEMPORARY APPOINTMENTS.

Temporary appointments are not favored by the civil-service rules, and in this Department are permitted only in cases where it is impracticable to make permanent appointments. The new system of certification of eligibles, known as the district system, has, however, caused an appreciable increase in the number of temporary appointments in the field service of the Department, as the district secretaries are frequently unable to certify eligibles for permanent appointment even after the lapse of considerable time. Before the inauguration of the district system it was a rare occurrence for the Commission to be without eligibles to fill a vacancy. The Department feels that the condition created by this system is regrettable, because the best interests of the service demand that vacancies be filled permanently as soon as possible. It is evident that where temporary appointments are made the Government must frequently utilize a great deal of energy, which could be better employed, in training and developing employees with no hope of receiving the benefit of their increasing efficiency.

EFFICIENCY OF THE PERSONNEL.

The 1911 inquiry into the efficiency of the officers and employees of the Department below the presidential class may be considered as closed. The primary object of these periodical inquiries is to obtain efficiency ratings to serve as a basis in determining the eligibility of employees for promotion, but there are other benefits to the service which it is impossible to bring about by any other means. The standard of efficiency required in the last inquiry was higher than in the inquiry of 1909, but notwithstanding this fact the number of cases requiring action was nearly 50 per cent less. By reason of experience and training the value of an employee is constantly changing, and, as shown by these reports, usually improving. The transfer from one kind of work to another often brings out new qualifications of which a superior officer is unaware. The result is that so far as it is possible to grade the employee fairly from any system of efficiency reports it has been done, and it is the belief of the officers who considered the reports that the changes brought about by the information contained therein are of permanent value.

PROMOTIONS.

In the periodical investigations into the efficiency of the personnel an attempt has been made to obtain absolutely reliable ratings for every employee, based (1) on his worth in the particular position and (2) on his value as compared with others in the same class and grade. In promotions that have been approved these ratings have been the

governing factors unless subsequent reports have so altered the situation as to show that such action would be inconsistent with the general scheme. This plan, which is practically that enacted into law in the last legislative, executive, and judicial appropriation act, has been in operation throughout my incumbency of office. But just as there are defects in other features of administration, there are weaknesses in the system at present employed, and to overcome these there should be, first of all, a reclassification of the entire service so that the designation of the grade and class held by a particular employee will indicate the importance and the quality of the work in which he is engaged as well as the compensation that should be regarded as commensurate therewith.

SUPERANNUATION AND RETIREMENT.

Executive officers of the Government fully realize that the highest efficiency in the administration of the public business can not be attained until suitable legislation is provided for the retirement of superannuated employees. It is probable that action has not been taken because practically every scheme proposed involves a considerable preliminary outlay by the Government.

The President's Commission on Economy and Efficiency recently ascertained that the loss annually from superannuation in the classified service in the District of Columbia amounts to $220,954. Probably this amount does not represent the actual loss sustained, for despite the wholly impersonal nature of the inquiry allowance must be made for the natural reluctance on the part of executive officers to rate an employee as notably inefficient. It emphasizes, however, especially when coupled with the deplorable effects of superannuation upon the future efficiency of the service, the need for some form of retirement, whether on an annuity basis or otherwise. Most convincing is the following statement of a bureau officer of this Department, whose views upon the subject are entitled to much consideration:

A considerable proportion of our positions, both in the lower and middle grades, is filled by superannuated employees who are becoming more and more unsuitable for the increasingly difficult work of the Bureau and whose possibility of advancing any higher than their present grade of work is already absolutely closed. In consequence, as we lose experienced and valuable employees and go over the list of those in the grades below to find men to fill their places, we find in many instances that there is not only no one to take the places of the employees whom we have lost, but that there are very few who have even the possibility of ever being trained to take the places. In other words, positions that should be filled by young men who each year would become more valuable and better prepared to fill the more important places in the Bureau are filled by old men who can scarcely do their present work satisfactorily and whose usefulness is lessening and whom we can never expect to be available for the more important positions as they become vacant. The effect of this is to

absolutely paralyze the development of the Bureau to a degree out of all comparison with the actual number of superannuated employees. This condition has already existed in the Bureau so long that there is a tremendous and disastrous gap between the men holding the most responsible positions in the Bureau and those who in the event of vacancies would be called upon to take their places. In this way the effect of superannuation on our development is a much more serious matter than on our immediate efficiency, serious as this latter already is.

Until this problem is met the Government must continue to bear the great expense of allowing its superannuated employees to remain on the rolls and as they grow older to accept from them a smaller quantity and lower quality of work.

LAW OF APPORTIONMENT.

Section 2 of the civil-service act of January 16, 1883, provides that appointments to the public service in the departments at Washington shall be apportioned among the several States and Territories and the District of Columbia on the basis of population as ascertained at the last preceding census. However desirable it may be to have the employees of the executive civil service at Washington represent every section of the country, there can be no denial of the fact that compulsory geographical distribution of appointments necessarily restricts that freedom of choice which the appointing officer might otherwise exercise in the selection of employees. It is believed to be generally conceded by those actually concerned with its operation that the law of apportionment is not in the interest of good administration. As is well known, it frequently happens that choice is limited to poorly qualified eligibles who, although they made low averages in the examination, were certified because they resided in States that were behind in the apportionment; and this under the law must necessarily be so, regardless of the fact that there are plenty of thoroughly equipped eligibles from other States. Thus the service manifestly suffers. The inconvenience and diminished economy and efficiency in the service consequent on the operation of the law do not appear to be justified, especially when the fruitlessness of the attempts that have thus far been made to maintain even an approximate equilibrium between the number of appointments to which the States are entitled and those which they actually receive is considered.

This law of apportionment applies to every transfer from the nonapportioned to the apportioned service, intradepartmental as well as interdepartmental, and on the occurrence of vacancies in positions requiring special qualifications the work of the Department has suffered because the Civil Service Commission has not always felt at liberty to authorize the transfer of persons whom the Department knew to possess just the qualifications desired.

LIGHTHOUSE SERVICE.

The act of June 17, 1910, provided for the rearrangement of the Lighthouse Service into not exceeding 19 districts, with a lighthouse inspector in charge of each. The act also authorized the President to assign Army and Navy officers to act in lieu of civilian inspectors for a period not to exceed three years, except in the districts including the Mississippi River and its tributaries, in which he was authorized to designate Army engineers to act as inspectors for a period not specified. The Service has been rearranged into districts in accordance with the provisions of this act. No inspectors were appointed during the fiscal year ended June 30, 1911, as no appropriation was made for the payment of their salaries. An appropriation for 17 inspectors became available on July 1, 1911, since which date civilian inspectors have been gradually supplanting the Navy officers assigned to 16 of the 19 lighthouse districts. At the close of the fiscal year 13 appointments had been made, 12 by the promotion of persons already in the Lighthouse Service and 1 by the transfer of an experienced employee from the Coast and Geodetic Survey. One inspector, appointed for temporary duty as a general inspector, has not been assigned to any particular district. The ninth, eleventh, twelfth, and nineteenth districts were still in charge of Navy officers, while the thirteenth, fourteenth, and fifteenth districts, which include the Mississippi River and its tributaries, remain under the supervision of Army engineers.

INTERNATIONAL CONGRESSES AND EXPOSITION.

During the fiscal year the Department was represented, by invitations from foreign diplomatic representatives, at six international congresses and one international exposition as follows: The Thirteenth Session of the International Statistical Institute, held at The Hague in September, 1911; the Second International Congress of the Applications of Electricity, at Turin, Italy, September 10–17, 1911; the Sixth International Congress of Firemen, held at St. Petersburg, May 25–28, 1912, and the International Exposition of Fire and Salvage, held during six weeks in May and June, 1912, at the same city; the Radio-Telegraphic Congress, held in London, June 4, 1912; the Seventh International Esperanto Congress, held at Antwerp, August 20–27, 1911; and the Twelfth International Congress of Navigation, held at Philadelphia, in May, 1912.

It is now generally recognized that these congresses bring about beneficial results, owing to the interest taken in the work by representative men of various nationalities.

DIVISION OF PUBLICATIONS.

VOLUME AND COST OF PRINTING.

The Department (exclusive of the Bureau of the Census) was allotted the sum of $375,000 for printing and binding for the fiscal year ended June 30, 1912. Of this sum, $374,995.64 was expended, leaving a balance of $4.36 to be covered into the Treasury. The increase in expenditures as compared with the fiscal year 1911 was $4,827.89, or 1.3 per cent.

The following table shows the quantity and cost of each class of work ordered from the Public Printer during the fiscal years 1910, 1911, and 1912:

Class.	1910		1911		1912	
	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.
Blank forms	9,639,875	$43,038.25	12,378,007	$51,369.94	12,269,911	$51,112.95
Reports, pamphlets, etc.	3,118,330	263,873.66	5,276,080	269,387.99	6,935,745	288,017.67
Letterheads	2,056,500	5,432.36	2,254,000	4,209.92	2,110,000	3,830.71
Envelopes	85,577	220.80	98,250	175.10	46,225	156.19
Circulars, decisions, and notices	350,775	4,013.93	370,525	2,986.76	308,450	1,882.06
Index cards	994,000	1,025.97	1,644,500	1,397.56	689,200	692.25
Guide cards and folders	426,400	2,043.32	623,310	2,352.07	595,150	1,826.50
Memorandum sheets	3,802,900	3,135.66	3,506,700	2,665.06	1,156,400	1,252.48
Blank books	52,977	32,147.14	28,069	30,103.46	19,113	23,064.25
Miscellaneous books (binding)	3,057	5,804.18	2,858	5,448.64	1,355	2,532.35
Miscellaneous	.....	795.16	.....	71.25	.....	628.23
Total	.....	361,530.43	.....	370,167.75	.....	374,995.64

During the year the Department issued 3,466 requisitions on the Public Printer, as compared with 3,337 in 1911, an increase of 129. There were decreases in the quantities ordered of each of the classes of work enumerated in the foregoing table, except reports, pamphlets, etc. Of this class, which is the most expensive of the several classes enumerated, there was an increase in the number printed of 1,660,000, or 31.46 per cent. Decreases in the quantities of the less expensive items resulted in savings in costs amounting to $13,801.79, but these savings were more than offset by the increase in the cost of publications, which amounted to $18,629.68. It is worthy of note, however, that the increase in the cost of the Department's publications was a little less than 7 per cent, while the increase in the product was more than 30 per cent.

The table following gives the expenditures for printing and binding for each bureau, office, and service (except the Bureau of the

Census) for the fiscal years 1910, 1911, and 1912, and the increase or decrease in 1912 as compared with 1911.

Office, bureau, or service.	1910	1911	1912	Increase (+) or decrease (−) in 1912.	
				Cost.	*Per cent.*
Office of the Secretary	[1] $21,026.94	[2] $17,756.67	$14,318.95	−$3,437.72	− 19.36
Bureau of Corporations	8,177.84	10,799.12	9,299.40	− 1,499.72	− 13.89
Bureau of Manufactures	50,226.55	54,528.57	63,535.39	+ 9,006.82	+ 16.52
Bureau of Statistics	90,258.97	83,692.47	82,243.19	− 1,449.28	− 1.73
Bureau of Labor	33,904.76	39,870.96	39,287.04	− 583.92	− 1.46
Coast and Geodetic Survey	31,138.93	22,510.15	31,267.82	+ 8,757.67	+ 38.91
Bureau of Fisheries	14,916.45	14,942.87	9,740.45	− 5,202.42	− 34.82
Bureau of Navigation	9,034.08	9,399.64	12,321.44	+ 2,921.80	+ 31.08
Shipping Service	2,494.04	2,410.15	2,669.20	+ 347.62	+ 14.42
Navigation Service	.....	[3]	88.57		
Office, Supervising Inspector General, Steamboat-Inspection Service	5,870.12	3,931.87	4,278.54	+ 346.67	+ 8.82
Steamboat-Inspection Service	9,607.59	11,140.62	10,630.73	− 509.89	− 4.58
Bureau of Lighthouses	17,930.11	20,229.48	18,168.35	− 2,061.13	− 10.19
Lighthouse Service	8,019.76	10,636.51	9,223.16	− 1,413.35	− 13.29
Bureau of Immigration and Naturalization	5,999.70	6,476.40	5,111.57	− 1,364.83	− 21.07
Immigration Service	19,240.08	17,542.38	14,015.66	− 3,526.72	− 20.10
Division of Naturalization	755.24	1,046.83	1,244.77	+ 197.94	+ 18.91
Naturalization Service	11,116.01	18,520.57	11,969.89	− 5,594.71	− 30.21
Naturalization examiners	.....	[4]	955.97		
Division of Information	744.78	429.21	1,742.99	+ 1,313.78	+306.09
Bureau of Standards	9,982.98	15,764.51	20,475.67	+ 4,711.16	+ 29.88
Customs Service	11,085.50	8,538.77	12,406.89	+ 3,868.12	+ 45.30
Total	361,530.43	[2] 370,167.75	374,995.64	+ 4,827.89	+ 1.30

[1] Of this amount $1,337.43 was for supplies furnished to the Bureau of the Census, which reimbursed the Department's allotment to that extent.

[2] On April 17, 1912, the Public Printer rendered a bill covering an additional charge against the Department on account of the printing and binding for the General Supply Committee for the fiscal year 1911 of $137.53. This explains the difference in the figures here and those published in my annual report for 1911.

[3] Cost of work for Navigation Service carried under the Bureau of Navigation account.

[4] Cost of work for naturalization examiners carried under the Naturalization Service account.

DISTRIBUTION OF PRINTED SUPPLIES.

There were received and filled during the past year 9,375 requisitions from the various outside services of the Department calling for 8,097,302 blank forms, as compared with 8,821,689 in 1911, and 315,203 books and pamphlets, as compared with 343,867 in 1911. There were also received and filled during the year from offices and bureaus of the Department in Washington 362 and from the outside services 358 requisitions for printed stationery, a total of 720, as compared with 709 in the preceding year. The 720 requisitions called for 5,400,000 envelopes, 2,110,000 letterheads, 3,023,000 memorandum sheets, 4,800 stenographers' notebooks, 6,300 blank books, 786,000 index and guide cards, 308,000 vertical folders, and 81,000 blank forms.

PUBLICATION WORK.

During the fiscal year 1912 there emanated from the Department, exclusive of the Bureau of the Census, 887 publications, against 796 in the fiscal year 1911, or an increase of 91. Thirty-one of these, against 27 in 1911, were printed in two or more editions, while 51 were reprints of issues of earlier years. These publications contained a total of 54,702 printed pages, as compared with 47,883 in 1911, and there were issued of them for the Department a grand total of 7,144,490 copies, against 5,242,762 in the preceding year.

The publication work of each bureau for the past two fiscal years is summarized in the following table:

Bureau.	Publications.		Pages.		Copies printed for Department.	
	1911	1912	1911	1912	1911	1912
Office of the Secretary	34	36	1,302	1,706	255,500	213,350
Coast and Geodetic Survey	21	35	2,778	4,958	16,300	67,650
Corporations Bureau	14	16	5,086	3,019	17,200	28,700
Fisheries Bureau	48	44	3,420	3,530	38,000	31,775
Immigration and Naturalization Bureau	38	50	1,070	1,341	96,900	139,575
Labor Bureau	26	38	8,534	12,375	93,200	153,600
Lighthouse Bureau	84	105	3,419	3,023	189,630	238,375
Manufactures Bureau	340	346	8,541	7,881	4,060,882	5,659,655
Navigation Bureau	8	9	1,343	3,051	17,000	15,600
Standards Bureau	87	95	3,195	4,765	63,350	88,150
Statistics Bureau	84	94	7,808	7,506	96,400	129,910
Steamboat-Inspection Service	12	19	1,387	1,547	298,400	378,150
Total	796	887	47,883	54,702	5,242,762	7,144,490

DISTRIBUTION OF PUBLICATIONS.

Section 8 of the act providing for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June 30, 1913, approved August 23, 1912, provides:

That no money appropriated by this or any other Act shall be used after the first day of October, nineteen hundred and twelve, for services in any executive department or other Government establishment at Washington, District of Columbia, in the work of addressing, wrapping, mailing, or otherwise dispatching any publication for public distribution, except maps, weather reports, and weather cards issued by an executive department or other Government establishment at Washington, District of Columbia, or for the purchase of material or supplies to be used in such work; and on and after October first, nineteen hundred and twelve, it shall be the duty of the Public Printer to perform such work at the Government Printing Office. Prior to October first, nineteen hundred and twelve, each executive department and other Government establishment at Washington, District of Columbia, shall transfer to the Public Printer such machines, equipment, and materials as are used in address-

ing, wrapping, mailing, or otherwise dispatching publications; and each head of such executive department and other Government establishment at Washington, District of Columbia, shall furnish from time to time to the Public Printer mailing lists, in convenient form, and changes therein, or franked slips, for use in the public distribution of publications issued by such department or establishment; and the Public Printer shall furnish copies of any publication only in accordance with the provisions of law or the instruction of the head of the department or establishment issuing the publication. The employment of all persons in the several executive departments and other Government establishments at Washington, District of Columbia, wholly in connection with the duties herein transferred to the Public Printer, or whose services can be dispensed with or devolved upon another because of such transfer, shall cease and determine on or before the first day of October, nineteen hundred and twelve, and their salaries or compensation shall lapse for the remainder of the fiscal year nineteen hundred and thirteen and be covered into the Treasury. A detailed statement of all machines, equipment, and material transferred to the Government Printing Office by operation of this provision and of all employments discontinued shall be submitted to Congress at its next session by the head of each executive department and other Government establishments at Washington, District of Columbia, in the annual estimates of appropriations: *Provided*, That nothing in this section shall be construed as applying to orders, instructions, directions, notices, or circulars of information, printed for and issued by any of the executive departments or other Government establishments or to the distribution of public documents by Senators or Members of the House of Representatives or to the folding rooms and documents rooms of the Senate or House of Representatives.

During the month of September, 1912, the Division of Publications was busily engaged in carrying out the provisions of the foregoing section of law, the following machines, equipment, and materials used in addressing, wrapping, mailing, or otherwise dispatching publications of the Department being transferred to the Government Printing Office:

1 F. D. Belknap rapid addressing machine No. 351.
1 F. D. Belknap wrapper cutter for cutting wrappers 12 to 24 inches in length.
1 F. D. Belknap wrapper cutter for cutting wrappers 7 to 14 inches in length.
1 canvas cover for F. D. Belknap rapid addressing machine No. 351.
5 paper feed rollers for F. D. Belknap rapid addressing machine No. 351, as follows: 1 for 9-inch paper; 1 for 15-inch paper; 1 for 16-inch paper; 1 for 18-inch paper; 1 for 24-inch paper.
25 metal shafts for composition rollers.
1 wrapper table.
4 wrapper weights.
9 electrotypes for printing "Department of Commerce and Labor" return cards.
2 electrotypes for printing penalty franks for large cutter.
3 electrotypes for printing penalty franks for small cutter.
10 rubber buffs for wrapper cutters.
5 pounds of Jaenecke printing ink.
120 rolls, or about 9,600 pounds, of 9-inch paper for use in mailing the Daily Consular and Trade Reports.

24 rolls, or about 1,830 pounds, of 9-inch paper for use in sending out miscellaneous publications.

63 rolls, or about 4,320 pounds, of 11½-inch paper for use in sending out the Monthly Summary of Commerce and Finance, and similar publications.

40 solid-back cases 4 feet wide by 5 feet high by 19½ inches deep, together with 30 bases 4 feet wide by 4 inches high by 19½ inches deep.

20 solid-back cases 5 feet wide by 5 feet high by 19½ inches deep, together with 10 bases 5 feet wide by 4 inches high by 19½ inches deep.

1 barrel (33 gallons) and part of another barrel (15 gallons) stiff white paste for use in sealing wrappers.

10,000 metal protectors for book corners (item 1428, General Supply Committee's Schedule) for use in protecting in the mails the corners of bound publications.

1 long-handle ladle for paste.

13,900 tags, in pads of 100 each, for mail bags.

97,186 paper stencils, and 151 tin trays for holding the same, for 61 regular mailing lists.

Also there were transferred from the Bureau of Standards 1 Elliott addressing machine, old style, with stand; and from the Bureau of Fisheries 1 Addressograph addressing machine, Model A, No. 1109, mounted on a 27-drawer cabinet; 1,584 four-line type holders containing obsolete addresses; 112 four-line type holders without addresses; and 2 boxes of assorted rubber type.

The employments in the Division of Publications dispensed with in accordance with the provision of law quoted above were 6 in number with salaries aggregating $3,820, as follows: 1 clerk, at $1,000 per annum; 1 assistant messenger, at $720 per annum; 1 laborer, at $660 per annum, and 3 laborers, at $480 each per annum.

Also 1 clerk at $900 was dispensed with by the Bureau of the Census, making a total for the Department of 7 employees with combined salaries of $4,720.

There were also transferred to the Public Printer editions on hand of 2,557 different publications, aggregating 768,000 copies.

The new law does not relieve the Division of Publications of any of the duties incident to the distribution of publications except those of addressing wrappers in cases where stencils are provided for mailing lists and the actual labor of wrapping publications intended for public distribution. The correspondence and record keeping are in no sense decreased, but rather increased, and the work in connection with the maintenance of mailing lists as well as the writing of franks for mailing lists not provided with stencils still falls on the Division. This work is constantly increasing, as is evidenced by the large increase in the number of publications issued by the Department.

The number of publications, together with their weights, sent out by the Division of Publications during each month of the fiscal year 1912 is shown in the following table:

Month.	Publications.	Weight.	Month.	Publications.	Weight.
		Pounds.			*Pounds.*
July	469,166	46,287	February	537,580	66,082
August	519,117	80,617	March	571,539	52,007
September	479,943	58,321	April	619,282	73,044
October	526,988	64,786	May	611,737	82,344
November	495,224	51,313	June	574,063	63,554
December	532,653	61,388			
January	547,214	72,028	Total	6,484,506	771,771

The foregoing statement shows an average of more than 21,000 publications, weighing nearly 2,600 pounds, mailed each working day during the year, as against about 19,000, weighing 2,400 pounds, the previous year.

TEST OF DUPLICATING MACHINES.

During the past year the Division of Publications was called upon to conduct a test of machines designed to duplicate typewritten letters, the object of the test being to try out two of the best known machines on the market with a view to determining which of them would best serve the needs of the Department for this class of work.

To avoid unfair discrimination and to eliminate the personal equation in the conduct of the test, two inexperienced operators were employed on the machines, and these alternated on them from time to time, so that the possible greater efficiency of one or the other of the operators might not work to the advantage of either machine. The time occupied by the test was divided into two periods, the first extending from April 15 to July 10, 1912, and the second from July 15 to August 22, 1912. As was anticipated, much greater efficiency was attained by the two operators during the second period than during the first period, due to greater familiarity with the operation of the machines.

A careful record was kept during the entire test of every piece of work assigned to each machine. This record was designed to furnish data from which the actual speed of each machine could be determined, as in no other way could their relative efficiency be arrived at from a test of only a few weeks. Of course, there are other factors, such as lasting qualities, which would enter into any proper consideration of their relative merits, but a test of limited duration necessarily could not embrace those phases.

At the end of the test, the Department made a choice between the two machines which had been on trial, and established in the Division of Publications a section for duplicating work for such of the bureaus and offices of the Department as have no equipment of their own for this work.

SALES OF PUBLIC DOCUMENTS.

The recommendation, made in previous annual reports, that certain classes of public documents be limited in their distribution to libraries and to persons who are willing to pay a nominal sum for them, is again renewed, as it is my strong belief that in that way principally can waste in the public printing be avoided. I do not believe that even as much as the actual cost of production should be charged for these publications, but the price should be sufficient to prevent thoughtless and often repeated requests for publications which in many cases have no special interest or value to the parties making the requests. A result of the present system is that the necessarily limited editions are often soon exhausted by demands from sources which frequently can not be benefited by the publications, while those to whom they are of interest are in many cases deprived of them. This applies particularly to many publications of this Department, though other branches of the service encounter the same situation. I believe that the head of each Department and Government establishment should be authorized by law to fix a price at which any publication issued by it shall be sold, and that the receipts from such sales should be deposited to the credit of its allotment for printing and binding. This would permit of a wise and beneficial distribution of documents and also make it possible to reprint documents where there are sufficient demands for them without the danger of exhausting the regular allotments. This plan in some form is practiced by many European governments, who long ago saw the necessity for placing reasonable restrictions on the free distribution of their reports, and it has been occasionally resorted to by our own Government, although it has not been adopted as a general policy.

OFFICE OF THE SOLICITOR.

CONDENSED SUMMARY OF WORK.

The following is a condensed summary of work done by the Office of the Solicitor during the fiscal year ended June 30, 1912:

Legal opinions rendered, formal and informal (memorandum)	577
Claims, injured employees' compensation act (involving examinations as to law and facts) received by this office	2,059
Contracts examined (approved, disapproved, drafted, redrafted, modified; involving expenditures amounting to $1,455,776.70)	308
Contracts examined (indeterminate amounts; fuel, supplies, etc.)	58

Leases examined (approved, disapproved, etc.; involving expenditures amounting to $71,073.28)	64
Bonds, contract, examined (approved, disapproved, etc.; amounting to $563,287.50)	154
Bonds, official, examined (approved, disapproved; amounting to $308,000)	76
Bonds, alien immigrants, examined (approved, disapproved; amounting to $848,300)	1,294
Miscellaneous matters, embracing everything submitted for the advice or suggestion of the Solicitor, or for the formulation of departmental action, not included in the foregoing items	833
Total number of matters disposed of	5,423

COMPENSATION TO INJURED GOVERNMENT EMPLOYEES.

The subject of compensation to workmen for injuries received by them in the course of employment has attracted much and favorable attention in late years. The administration of the act of Congress of May 30, 1908, applying the principle of compensation to certain employees of the United States, has constituted one of the Department's more important functions. This act was a pioneer among compensation acts in the United States. Since its enactment, 16 States have passed laws of a similar character, and this number is likely to be increased. Although the scope of the act is limited, the benefits conferred within such limits have been many and real. The legislation in question is of a type involving a decided departure from long established rules of legal liability, thus giving rise to new questions of right and obligation. In passing upon several thousand claims for compensation under the act, the questions arising for determination on legal grounds have naturally been numerous and varied, and the opinions of the Solicitor, dealing with these questions as the legal adviser of the Department, might fairly be assumed to be of some positive interest and value to those concerned with the interpretation and application of this and similar laws. These considerations, in addition to the general interest in the subject, led me to authorize the publication of the Solicitor's opinions in book form, so that the principles governing the Department in the administration of the act might be available to persons outside the Department. This collection of opinions, moreover, by marking the scope of the present law and thus indicating the cases which are not covered thereby, as well as those which are covered, is calculated to serve a useful purpose in connection with framing further legislation with a view to extending the benefits of the act. The act now applies only to artisans or laborers, and to such persons only when employed in specified branches of the public service. The fact that over 17,000 accidents were reported under the act during the first three years of its operation, whereas but about 8,000 claims were filed, suggests the need of supplementary laws.

BUREAU OF THE CENSUS.

Much the greater part of the work of the Bureau of the Census during the fiscal year has been on the tabulation and publication of the results of the Thirteenth Decennial Census. The usual annual investigations regarding statistics of cities, production and consumption of cotton, vital statistics, and forest products have been carried on, but there has been no special investigation under the authority of the permanent census act, such special investigations being intended primarily to occupy intercensus periods. The only field work which has been performed by the Bureau during the fiscal year is that with relation to statistics of cities and production and consumption of cotton.

GENERAL PROGRESS OF DECENNIAL CENSUS.

In August, 1911, the Director submitted a request for a further appropriation by Congress of $1,000,000 for the fiscal year 1912, to enable the Census Bureau to complete the Thirteenth Census work, with certain specified exceptions, by the end of that fiscal year, as required by law. In December, 1911, Congress appropriated $500,000 in response to this request. As was pointed out at the time the matter was considered by Congress, this sum was not sufficient to enable the Bureau to complete and publish the results of the decennial census by the close of the fiscal year. It was found necessary therefore to defer substantially all work with relation to the subjects of occupations, statistics of the foreign born according to country of birth, and defective, delinquent, and dependent classes until the fiscal year 1913. These branches of the work being less advanced than any others, it was considered wisest to concentrate the use of the available funds upon other lines of work.

It was not found possible to complete entirely even the other lines of work within the fiscal year 1912, but such progress was made that it is expected that the Abstract of the Census, including the reports on all subjects except the three specified above, will be published about December 1. In the meantime, through press announcements and preliminary bulletins, practically all of the results of the Thirteenth Census have been made public except for the subjects mentioned above.

The Bureau had, prior to the close of the fiscal year 1912, issued a complete series of State bulletins giving the full results of the census of manufactures for each State. It had also issued a complete series of State bulletins regarding the number of inhabitants of each State and of its cities, villages, counties, and minor civil subdivisions, and a complete series of State bulletins giving the principal facts with regard to agriculture, by counties. A second series of State bulletins

giving the details regarding the composition and characteristics of the population of each State and its principal subdivisions has been begun, and it is expected that the entire series will be published before the end of the calendar year. A second series of State agricultural bulletins is also being issued. This reproduces the information contained in the first series and supplements it with the remaining available data. All of these bulletins also will probably be published before the end of the calendar year, as will likewise be a series of bulletins regarding the mining industries of each State.

As explained in my annual report for 1911, it is the intention at the present census to bind up all of the State bulletins relating to a given State as a supplement to the edition of the Abstract of the Census intended for distribution to the citizens of that State. The Abstract of the Census will, as explained in that report, be a somewhat more elaborate document than that issued at the Twelfth Census. It will contain more comparative figures for previous censuses and a greater number of percentages, averages, and other derivative figures. It will also contain a text bringing out the more important features of the statistics. Several bulletins containing sections of the Abstract have already been issued, and, as just stated, the Abstract itself will be completed about December 1.

PLANS FOR THE FISCAL YEAR 1913.

Owing to the inadequacy of the appropriations for the fiscal year 1912, it was found necessary, as already stated, to defer a considerable quantity of Thirteenth Census work until the fiscal year 1913. It is believed that it will be possible to complete, or very nearly to complete, all of the deferred work during that year, particularly by reason of the fact that Congress authorized the employment of not to exceed 175 temporary clerks during the year in addition to the permanent force of the Bureau. Aside from this Thirteenth Census work, most of the force of the Bureau will be employed in conducting the regular annual investigations required by law. In the spring of 1913 a beginning will be made upon a census of the electrical industries—street railways, electric light and power, telegraphs, and telephones. This inquiry will relate to the calendar year 1912, and the field work will be completed and the results compiled during the fiscal year ending June 30, 1914.

NEW LEGISLATION ENACTED BY CONGRESS.

During the last session of Congress two acts were passed which increased the duties of the Census Bureau. The first provided for the collection, as of October 1 and April 1 of each year, of statistics regarding the stocks of leaf tobacco held by manufacturers and deal-

ers. The law exempted the smaller manufacturers and dealers, but required all others, under penalty, to make the required reports. The first statistics under this act are being collected as of October 1, 1912. The Director of the Census estimated that it would probably cost $25,000 to carry out the provisions of this act, at least during the first year, when the work is in process of organization. Congress made a special appropriation of $15,000 to enable the Bureau to carry out the act relating to statistics of stocks of tobacco, and every effort will be made to collect the statistics in conformity with the law within the limits of this appropriation.

The second act referred to provided that statistics of the consumption, stocks, exports, and imports of cotton and the number of cotton-consuming spindles shall be collected by the Bureau of the Census monthly, instead of quarterly as at present, and also made certain minor changes as to the method of publishing the statistics of production of cotton. The object of this legislation was to furnish producers of cotton with information concerning stocks, consumption, and other matters affecting demand as frequently as consumers of cotton are furnished with statistics of its production or of the condition of the crop.

The Director of the Census estimated that the additional expense necessitated by these changes in legislation with reference to cotton statistics would amount to $57,250. Congress appropriated $30,000 for that purpose. This sum can be made adequate only by paying a very small additional compensation to the special agents in Southern States for the extra work imposed upon them. The special agents whose principal duty is the collection of statistics of cotton ginning during the ginning season have hitherto been able to collect most of the required statistics regarding stocks of cotton at the same time that they collected the statistics of cotton ginning; but the additional reports required by the new legislation will have to be made at different times and will necessitate special trips from place to place. Owing to the limited appropriation, however, the special agents can not be paid any higher compensation per establishment visited for these canvasses requiring special trips than has been paid for those not requiring additional travel.

OFFICE FORCE.

The fact that Congress appropriated only half of the additional sum of $1,000,000 requested for the Census Bureau during the fiscal year 1912 rendered it necessary to dismiss all of the temporary clerks who had been employed under the authority of the Thirteenth Census act within a very short time after this action of Congress was taken. The force had already been reduced from a maximum of about 3,800 in September, 1910, to about 2,300 in December, 1911, of whom 1,700

were temporary employees. Most of these temporary employees were dismissed either on December 31, 1911, or on January 10, 1912, and all of the remainder were dropped from the rolls on February 29, 1912.

The permanent force of the Census Bureau during the fiscal year 1909 numbered 626, but during the decennial census period vacancies in the permanent force were for the most part not filled, the large number of temporary employees rendering such action unnecessary. Consequently, after the dismissal of the temporary employees the force of the Bureau stood at a lower figure than in 1909 or for some years previous thereto. On June 30, 1912, the total number of permanent employees of the Census Bureau in Washington was 567, of whom 472 were clerks and the remainder higher officials, laborers, watchmen, messengers, charwomen, etc.

The appropriation act for the fiscal year 1913 provides for the employment of 610 permanent employees, or substantially the same number as were authorized in 1909. At the urgent request of the Director of the Census, however, there was some redistribution of the clerical employees among the several salary classes. The Bureau had had an entirely inadequate number of clerks at the higher salaries, and also a very small number of clerks at $900. During the Thirteenth Census period a larger number of clerkships at salaries above $1,200 had been authorized, and many of the permanent employees had been promoted. Had the clerks under the appropriation for 1913 been classified in the same way as for 1909, it would have been necessary to demote practically every clerk receiving more than $1,200, and, on the other hand, it would have been necessary to make many new appointments at an entrance salary of $1,000. At the suggestion of the Director of the Census the appropriation bills were amended so as to increase somewhat the number of higher-paid places, thereby reducing materially the number of demotions necessary in these grades. This was accomplished without an increase of the appropriation for salaries by reducing the number of positions at $1,200 and increasing the number at $900, thus permitting the new employees to enter at the minimum salary.

Notwithstanding these modifications in the appropriation bill, it was necessary, when the act was passed in August, 1912, to demote no less than 180 of the permanent force of the Census Bureau. A very considerable proportion of the employees at salaries above $1,200 had to be demoted, a moderate proportion of those at $1,200 had to be reduced to $1,000, and a large proportion of those at $1,000 had to be reduced to $900. Subsequent vacancies which have occurred in the Bureau have permitted the restoration of a consider-

able number of the clerks to their former salaries, particularly of those who were reduced to $1,000 or $900.

The appropriation act of August 23, 1912, provided that the Civil Service Commission, in certifying eligibles from the examination registers for appointments to positions in the permanent census force during the fiscal year 1913 at salaries of $1,200 or less, should, subject to the law of apportionment, give preference to those who had been employed in the temporary Thirteenth Census force. In the case of several of the States, however, which take precedence in receiving appointments under the apportionment system, there are very few clerks upon the eligible registers who have had one year's experience in the Census Bureau. Consequently, while the Bureau has secured, and will hereafter secure, a considerable number of clerks for its permanent roll who have had the advantage of previous experience in census work, hardly more than half of the new permanent appointments will be of persons who have had such experience.

The appropriation act for 1913 also authorized the employment of not to exceed 175 temporary employees at salaries not to exceed $900 each, and appropriated $120,000 for that purpose. It was further provided that these temporary employees should be appointed by the Secretary of Commerce and Labor upon recommendation of the Director of the Census from among the former temporary Thirteenth Census employees. It was deemed best, in making these appointments, although not required by law, to apportion them among the States in proportion to population and then to confine the selections to persons actually present in the District of Columbia or in the immediate neighborhood, there being in nearly all cases an adequate number of former temporary employees from each State who were still present in the District or in the immediate vicinity. These employees were selected with reference to their efficiency while in the service of the Bureau and their experience upon the lines of work remaining to be performed.

The salary for these 175 temporary clerks was fixed at $720. Inasmuch as the appropriation act did not pass until August 23, it was not possible to appoint any of them before September 1, and many of them were not appointed until about October 1. Consequently, at the salary of $720 per annum, the appropriation of $120,000 is more than sufficient to compensate the 175 employees for the remainder of the fiscal year. As the Census Bureau has still a great amount of simple clerical labor to perform in connection with the Thirteenth Decennial Census, it will probably be desirable to recommend to the next Congress an amendment to the appropriation act increasing the limit of the number of temporary clerks who may be employed by virtue of this appropriation to 225.

Aside from the changes made in the clerical grades of the Census Bureau, above referred to, and minor changes with respect to the subclerical grades, the organization of the Bureau for the fiscal year 1913 was further modified with respect to the higher officials. The position of Assistant Director of the Census, created only for the decennial census period, lapsed on June 30, 1912; and under the new appropriation act of August 23, 1912, the positions of disbursing clerk, appointment clerk, one chief statistician (at $3,000), and four chiefs of division (at $2,000) also lapsed. With the exception of the position of disbursing clerk, all of these places had existed only during the decennial census period.

APPROPRIATIONS AND EXPENDITURES.

The Bureau operated under a lump-sum appropriation during the three-year decennial census period ending June 30, 1912. The appropriations made available during that period aggregated $15,000,000, in addition to which an appropriation of $150,000, for preliminary expenses of the Thirteenth Census, was made in March, 1909, to continue available until the close of the fiscal year 1910. The disbursements from these appropriations on account of Thirteenth Census work and the regular annual and permanent work of the Bureau are shown in the subjoined statement. As a considerable amount of the decennial census work, including the printing of the final reports, was carried over and provided for in the appropriations for the fiscal year 1913, the total cost of the Thirteenth Decennial Census can not be precisely ascertained until the close of the present fiscal year.

FINANCIAL STATEMENT OF THE THIRTEENTH DECENNIAL CENSUS TO JUNE 30, 1912.

APPROPRIATIONS, RECEIPTS, ETC.

Expenses of the Thirteenth Census, 1910–1912	$15,000,000.00
Preliminary expenses of the Thirteenth Census, 1909–10	150,000.00
Recoveries on account of overpayments	2,875.68
Receipts for transcripts of records	1,520.96
Reimbursement from Bureau of Immigration and Naturalization	13,506.80
Reimbursement from Government Printing Office	6,610.20
Reimbursement for photostat	500.00
Total	15,175,013.64

EXPENDITURES.

Thirteenth Census field work:	
Continental United States—	
Supervisors—	
Salaries	$585,188.00
Expenses	99,204.47
Assistance	495,755.85
Enumerators	4,755,060.06
Interpreters	37,349.51
Institutions, field work	118,197.80
Manufactures census—	
Salaries of special agents	412,739.21
Salaries of clerks detailed for field work	61,730.08
Travel, subsistence, etc	251,723.15
Irrigation—	
Salaries of special agents	43,025.50
Salaries of clerks detailed for field work	7,390.54
Travel, subsistence, etc	46,793.87
Other investigations—	
Salary and medical expenses of Alice V. Houghton	1,821.00
Salary, C. W. G. Brett, "Employees liability act, 1908"	101.11
Frauds and reenumerations	28,473.44
All other	50,497.57
Alaska	78,303.15
Porto Rico	113,728.85
Hawaii	34,749.79
Total	7,221,832.95
Compilation and publication of Thirteenth Census statistics:	
Salaries by divisions—	
Director's	55,803.47
Chief clerk's	336,729.57
Machine shop	118,254.63
Appointment	99,495.38
Disbursements	70,274.10
Geographer's	140,536.10
Publication	53,672.95
Revision and results	183,915.70
Population	2,181,816.70
Agriculture	1,002,139.72
Irrigation	25,463.65
Manufactures	673,096.34
Mining	118,489.44
Total salaries	5,059,687.75
Salaries of special agents	194,113.84
Tabulating machinery and mechanical equipment	338,040.99
Stationery	83,990.41

Compilation and publication of Thirteenth Census statistics—Continued.	
Rent	$103,729.42
Cards	67,322.90
Printing—	
Reports, including press notices	87,908.49
Other	141,780.92
Office maintenance	89,651.52
Furniture	17,686.88
Miscellaneous supplies	67,990.42
Total	[1] 6,251,903.54
Annual and other investigations of permanent Bureau:	
Cotton—	
Office work, salaries	42,859.83
Field work	656,407.91
Printing	14,755.52
Statistics of cities—	
Office work, salaries	94,356.29
Field work—	
Salaries of special agents	30,465.50
Salaries of clerks detailed for field work	55,967.00
Travel, subsistence, etc	60,826.18
Printing	19,942.56
Vital statistics—	
Office work, salaries	216,762.21
Field work (transcripts of records)	120,451.47
Printing	51,675.19
Forest statistics—	
Office work, salaries	105,146.40
Printing	10,101.20
Official register—	
Office work, salaries	32,768.99
Printing	44,180.67
International commission at Paris	2,155.75
All other investigations—	
Office work, salaries	41,639.93
Travel, subsistence, etc	13,009.23
Printing	61,861.53
Total	[1] 1,675,333.36
Grand total	15,149,069.85
Balance	25,943.79
Appropriation balance, "Expenses of the Thirteenth Census, 1910–1912"	6,337.44
Appropriation balance, "Preliminary expenses of the Thirteenth Census, 1909–10"	1,890.75
Balance on deposit in United States Treasury, Washington, D. C	4,605.66

[1] These figures include $29,716.50 salaries earned in June, 1912, but not on cash book on June 30, 1912.

Balance on deposit in United States subtreasury at New York, N. Y.	$11,015.35
Balance in office, including pay roll not on cash book on June 30, 1912	31,811.09
Total	55,660.29
Pay roll for salaries earned in June, 1912, but not on cash book on June 30, 1912	29,716.50
Balance	25,943.79

The amount called for by the estimates of the Bureau of the Census for the fiscal year 1913 was $1,572,440 (exclusive of the item for printing other than the printing of Thirteenth Census reports, which item is now included with the appropriations for the Department of Commerce and Labor as a whole). The amount actually appropriated by the act of August 23, 1912, is $1,503,920, in addition to which, as already stated, Congress appropriated $45,000 to enable the Bureau to carry out the provisions of the new legislation concerning tobacco and cotton statistics. The appropriations include $696,340 for salaries of regular employees, $342,000 for collection of statistics, $120,000 for salaries of temporary clerks, and $272,000 for the printing of Thirteenth Census reports.

For the fiscal year 1914 estimates have been submitted to Congress calling for substantially the same amount for the Bureau of the Census as was appropriated for 1913, minus the special sums for temporary clerks and for Thirteenth Census printing. The total as estimated is $1,240,720. Substantially the same number of clerks of each salary class are called for as were provided for in the fiscal year 1913, save only that there has been some slight increase to enable the Bureau to carry out the provisions of the new legislation regarding tobacco and cotton statistics. The estimates do not call for special sums to enable the Bureau to carry out these acts individually, but the required expenditure has been assigned to the item of clerical salaries and the lump item, "collection of statistics."

TABULATING MACHINES.

The card tabulating machinery of the Census Bureau was fully described in my last annual report. Mention should be made, however, of a very great improvement to the tabulating machine used in summarizing the results of the population census, upon which the experts and mechanicians of the Bureau of the Census have been engaged for the past year. The machines as constructed for use in the Thirteenth Census printed the results of the tabulation of each unit of area, and therein were more satisfactory than the machines used in the Twelfth Census, in which the results were recorded on dials and had to be copied off on sheets. The results, however, were printed

on narrow strips or ribbons of paper, a form which was found to be physically very inconvenient for the further processes of tabulation, and in order that different units of area might be combined conveniently it was necessary to transcribe the figures immediately from the strips upon posting sheets. The improvement, which consists of a new counting and printing attachment, greatly reduces the space occupied by the counters and prints the results for a series of areas one below the other directly on a result sheet of convenient size. This does away entirely with the process of copying the data from the strips of paper onto the original posting sheets. Fourteen machines—seven automatic and seven hand, or semiautomatic—will be equipped with these new devices. Two machines have been completed and are in actual operation, and the others will be completed in time to handle the population cards for occupation statistics. It is fully believed that the improvements will enable the Bureau to handle the cards of the occupation runs at an expense of between $40,000 and $50,000 less than would be necessary with the former machines.

While it may be possible before the census of 1920 is taken to devise such improvements as to render obsolete the present tabulating-machine equipment of the Bureau, there can be no doubt that the machine equipment purchased or constructed by the Bureau for the Thirteenth Census saved money as compared with leasing machines from private concerns, as was done for the census of 1900. There is good reason to believe, however, that the present improved machine, with perhaps minor alterations, will be available for the next census. In that case part of the machine expenditure for the Thirteenth Census will represent an investment which will correspondingly reduce the cost of taking the next decennial census of population.

Moreover, the Bureau has developed a corps of expert machinists and inventors who will be able to keep abreast of improvements in the art of tabulation by machinery, so that the Bureau will be able in the future to avail itself of the most improved machinery at reasonable cost. Furthermore, it is proposed to utilize this corps of experts and mechanicians after the present machine improvements have been completed in devising a card tabulating machine with an integrating counter; that is to say, a machine which will not simply count the holes in the cards, but will add figures indicated by holes. Such a machine would be adapted to general statistical and accounting work for other Government bureaus and departments.

The suit of the Tabulating Machine Co. against the Director of the Census, on the ground that the alterations made by the Bureau in the sorting machines which had been purchased from the Tabulating Machine Co. were practically equivalent to the construction of new machines, and, therefore, an infringement on the company's patents, was dismissed on May 23, 1912.

BUREAU OF IMMIGRATION AND NATURALIZATION.

IMMIGRATION IN GENERAL.

ALIEN ARRIVALS AND DEPARTURES.

It appears from the report of the Commissioner General of Immigration that 838,172 immigrant aliens entered the United States during the past fiscal year, compared with 878,587 in the fiscal year 1911, the decrease being 40,415. The months in which immigration was heaviest were March, April, May, and June, the figures for which range from about 91,000 to 114,000 per month. In addition to the 838,172 immigrants, 178,983 aliens of the nonimmigrant class entered, making a total of 1,017,155, compared with 1,030,300 for the previous fiscal year. During the year, however, there departed from the country 615,292 aliens, of whom 333,262 were of the emigrant and 282,030 of the nonemigrant class. In the previous fiscal year 518,215 aliens left the country, of whom 295,666 were of the emigrant and 222,549 of the nonemigrant class. A comparison of these figures shows that the actual increase in the alien population for the fiscal year 1912 was 401,863, as compared with 512,085 for the fiscal year 1911 and 817,619 for the fiscal year 1910.

AGES, LITERACY, AND FINANCIAL CONDITION OF IMMIGRANTS.

The statistical tables furnished by the Commissioner General disclose many interesting facts with regard to the 838,172 immigrant aliens admitted during the year, of which the following are especially significant:

The ages of 678,480 of these aliens ranged between 14 and 44 years, 113,700 were under 14, and 45,992 were 45 or over. Of the 724,472 aliens over 14 years of age, 177,284 could neither read nor write and 3,024 could read but could not write.

Of the aliens over 14 years of age admitted in the fiscal year 1910, 28 per cent were illiterate; in the fiscal year 1911, 24.5 per cent were illiterate; and in 1912 the percentage was approximately the same as in 1911.

The total amount of money shown to inspection officers by arriving aliens during the past fiscal year was $30,353,721, or an average of about $36 per person. There is no way to determine how much of this was sent to applicants by relatives or friends living in the United States.

Of the 838,172 who entered during the year, 536,802 claimed to have paid their own passage, 289,657 admitted that their passage had been paid by relatives, and 11,713 admitted that it had been paid by persons other than relatives. It is not easy to obtain accurate

information on this question. Apparently, however, either the assistance to aliens is on the increase or more frank admissions are being secured from those entering the country. The latter explanation is probably the true one. Statistics show that in 1910 only 25 per cent of incoming aliens were assisted; in 1911 this percentage increased to 33⅓, and during the past year there was a further increase to 36 per cent.

AGES AND PERIODS OF RESIDENCE OF DEPARTING ALIENS.

During the year 333,262 aliens emigrated from the United States. With respect to 33,080 of these no record could be procured as to length of residence here, as they left across the Canadian border. However, it is shown that 13,026 of these emigrants were less than 14, 282,111 ranged from 14 to 44, and 38,125 were 45 years of age or over; 220,571 had resided in the United States less than 5 years, 65,857 from 5 to 10 years, 8,552 from 10 to 15 years, 2,232 from 15 to 20 years, and 2,970 over 20 years.

SOURCES OF IMMIGRATION.

The past year witnessed no appreciable change in the disparity to which attention has heretofore been directed between the number of aliens entering the United States from northern and western Europe and the number entering from southern and eastern Europe. During the past year the bulk of the immigration was made up as follows: Belgium, 4,169; Denmark, 6,191; France, 8,628; German Empire, 27,788; Netherlands, 6,619; Norway, 8,675; Sweden, 12,688; Switzerland, 3,505; England, 40,408; Ireland, 25,879; Scotland, 14,578; Wales, 2,162; Italy, 157,134; Russia, including Finland, 162,395; Austria, 85,854; Hungary, 93,028; Greece, 21,449; Turkey in Europe and adjoining principalities, 14,481; Turkey in Asia, 12,788; Portugal, 10,230; and Spain, 6,327.

REJECTIONS OF ARRIVING ALIENS.

During the year 16,057 incoming aliens were found to belong to the excluded classes and were rejected. Because of the importance of this subject, a table in the report of the Commissioner General, giving comparisons between rejections for each principal cause for the years 1907 to 1912, inclusive, is reproduced here.

Cause of rejection.	1907	1908	1909	1910	1911	1912
Idiots	29	20	18	16	12	10
Imbeciles	.....	45	42	40	26	44
Feeble-minded persons	.....	121	121	125	126	110
Insanity (including epileptics)	189	184	167	198	144	133
Likely to become public charges, including paupers and beggars	6,866	3,741	4,458	15,927	12,048	8,182
Afflicted with contagious diseases	3,822	2,847	2,308	3,033	2,735	1,674
Afflicted with tuberculosis	.....	59	82	95	111	74
Physically or mentally defective	.....	870	370	312	3,055	2,288
Criminals	341	136	273	580	644	592
Prostitutes and other immoral women	18	124	323	316	253	263
Procurers of prostitutes	1	43	181	179	141	192
Contract laborers	1,434	1,932	1,172	1,786	1,336	1,333

ALIEN CONTRACT LABORERS.

In the fiscal year 1911, 1,336 aliens were excluded because found to be contract laborers and 21 were arrested and expelled from the country on the same ground; for the past year the corresponding figures are 1,333 and 31. The Commissioner General's report indicates, however, that these figures constitute by no means an adequate presentation of the work done by the Immigration Service in the enforcement of those provisions of law which contemplate that contract laborers shall not be admitted, and that those who attempt to import them shall be punished.

ARRESTS AND DEPORTATIONS.

In 1911, 2,788 warrants of deportation were executed after granting hearings to the arrested aliens; during the past year 2,456 were so executed. The aliens involved fall into the following general divisions as to causes of deportation: Members of the excluded classes at time of entry, 1,142; became public charges from causes existing prior to entry, 731; found to be prostitutes subsequent to entry, 23; supported by the proceeds of prostitution, 13; entered without inspection, 477; members of the class created by the act of March 26, 1910, viz, the sexually immoral who had been in the country more than three years, 54.

To the 2,456 deportations on warrant above mentioned should be added 16,057 rejected at the ports as members of excluded classes, making a total of 18,513 deported.

JAPANESE AND KOREAN LABORERS.

Satisfactory results are reported by the Commissioner General with regard to the enforcement of the President's proclamation of March 14, 1907. During the year 5,461 Japanese applied for ad-

mission to continental United States; of these, 5,358 were admitted and 103 debarred. Of those applying, 5,267 were and 194 were not in possession of proper passports. Of those holding such passports, 5,205 belonged to classes entitled to such credentials under the proclamation and understanding with Japan, and only 62 were not entitled thereto. The said 5,205 consisted of 1,704 former residents, 2,679 parents, wives, or children of residents, 819 new arrivals who were nonlaborers, and 3 settled agriculturists. The 62 not entitled to passports were laborers not former residents, or the parents, wives, or children of such residents, or settled agriculturists. During the same period 3,294 Japanese applied for admission to Hawaii, of whom 3,231 were admitted and 63 debarred. Of those applying, 3,277 had and 17 had not proper passports. Of those holding such passports, 3,148 were entitled and 129 were not entitled to them. Of the 3,148 entitled to passports, 809 were former residents, and 2,339 were parents, wives, or children of residents. The 129 consisted of 13 laborers and 116 nonlaborers who were neither former residents nor parents, wives, or children of residents.

CHINESE IMMIGRATION.

In the opinion of the Commissioner General, the law with respect to Chinese is now being more satisfactorily enforced. This is due in large measure to the Supreme Court's decision which supports the Bureau's contention that aliens of the Chinese race who enter the country in violation of the immigration law, as well as in contravention of the terms of the statutes relating to that race in particular, are subject to deportation on departmental warrants, without resort to judicial process, as is the case with all other aliens. This decision has made it possible to place serious discouragement in the way of those who are engaged in smuggling Chinese into the United States, for when the Chinese are apprehended they can be promptly deported to the country whence they came.

During the year the Department considered applications for admission of 5,886 Chinese, of whom 5,374 were admitted, 400 were deported, and 2 died, while 242 cases were pending at the close of the year. The corresponding figures for the previous year were: Total applications, 5,935; admissions, 5,107; deportations, 692; and pending at the close of the year, 136.

IMMIGRATION STATIONS.

The new site selected for the Boston immigration station is located in East Boston. Plans and specifications are now being prepared for the construction of a building thereon. The building finally secured for the Philadelphia station, at Gloucester City, N. J., was oc-

cupied by the force of employees in the fiscal year 1911, and an additional building erected there during the past year is now occupied as a detention station. The construction of a large pier on which a building for inspection purposes is to be erected has been started. The exchange of the site originally selected at Locust Point, Baltimore, for the building of an immigration station is under consideration, and it is hoped that a site in all respects suitable for the desired purpose may be obtained. At Charleston, S. C., the immigration building is approaching completion. The occupancy of the Galveston station has been delayed by the fact that no appropriation for furnishings was made by Congress until August 24, 1912. On that date, however, an appropriation of $15,000 was allowed for furnishing and equipping the said station and placing it in effective operation, and the necessary furnishings are being installed as rapidly as possible. At New Orleans, where condemnation proceedings were resorted to for procuring additional land immediately adjacent to the site originally acquired, the construction of the new immigration station is progressing rapidly, and the building will be occupied during the next fiscal year.

DIVISION OF INFORMATION.

During the fiscal year 1912 a series of seven bulletins was published by the Division of Information. Bulletin No. 1 deals with the resources, products, and physical characteristics of the North Atlantic States, while the South Atlantic States are similarly dealt with by No. 2, the North Central States (eastern group) by No. 3, the North Central States (western group) by No. 4, the South Central States by No. 5, the Western States (northern group) by No. 6, and the Western States (southern group) by No. 7. These bulletins set forth in compact form reliable data concerning principal crops, prices of land, special inducements to settlers, and especially agricultural opportunities in the various States, and point out the way to more complete information. A gratifying feature of these publications is the great demand for them by American citizens in congested population centers. The intention is to publish them in various foreign languages, so that they may be profitably distributed among the alien residents of this country who have heretofore known but little of the agricultural opportunities in the United States. Through the use of bulletins, the Division hopes to stimulate a desire on the part of such of these aliens as have funds in bank to invest their money in land in this country instead of returning to Europe with their savings. It is noted, however, that many applications for these bulletins have been received from American citizens residing in Canada who now desire to learn where lands in the United States may be secured.

The Division reports that 26,213 applicants for information as to opportunities for securing employment received such information from this branch of the service during the year, and it is estimated that the information obtained by these applicants was in turn imparted to many times that number. Of those who applied for information, 5,807 were directed to specific employment. Of the number actually so directed, failure of arrival was reported in but 7 cases. In only 3 of these cases was transportation advanced, and in 1 the unused portion of the ticket was redeemed and the money refunded.

The inspector in charge of the New York branch reports to the Division that wages have materially increased, having advanced in the case of common laborers from an average of $1.65 per day last year to about $1.80 per day at the present time. State road contractors are said to be offering $2 per day of eight hours at present as against $1.60 to $1.75 per day last year, while farmers are paying from $20 to $28 per month, with board and lodging, and operators in timber are paying choppers $35 to $40 per month, with board and lodging.

The Division invited certain officials from each State and Territory to meet in conference at Washington on November 16 and 17, 1911, for the purpose of securing cooperation between the various States and the Division of Information in making known the advantages and opportunities existing in the States. The response to the call for the conference was gratifying, there being representatives in attendance from 25 States and 1 Territory. Correspondence with officials of the States not represented indicated their approval of the steps taken. The conference expressed its belief that a large appropriation should be made by Congress to enable the Division of Information to induce residents of congested population centers to leave and engage in agricultural and other pursuits. It also favored the creation of State bureaus of information to cooperate with the Federal Government in this work. Those who attended the conference and many others who could not be present have since been active in cooperating with the Division, and definite steps have also been taken to secure from the granges of the several States effective cooperation in the directing of farm laborers.

The Division is not engaged in any "back-to-the-land" crusade. It is realized that many of those who seek its aid would prove failures if by any means they were induced to go on the land. The Division is convinced, however, that thousands of men brought up on farms have failed of success in our cities and now desire to take up land. Without proper information vouched for by a branch of the Government, they have continued to live in urban communities in ignorance of what this country contains and promises. To permit them longer to grope in the dark is an injustice to them, to the working men and

women of the cities with whose labor they come in direct competition, and to the country at large, the increasing cost of living in which may be largely attributed to the scarcity of food producers on the acres of tillable land and to the surplus of consumers in urban communities. With aliens, able and willing to till the soil, remaining in the cities after landing, and with the native children of the farms flocking to the cities, it is inevitable that prices of foodstuffs must rise.

The great drawback to venturing on the land by men of small means has been the size of American farms as compared with those of Europe. European farmers are accustomed to tilling small holdings, and lack the funds to pay for large farms. The Division proposes, therefore, to ascertain where small farms or holdings may be had and what they will produce, and to then place all needed data concerning them before those who seek information on the subject.

It is recommended that an appropriation be made sufficient to establish branches of the Division in Chicago, New Orleans, and San Francisco, for the purpose of securing accurate information concerning actual agricultural and industrial conditions in the various sections of the country.

DIVISION OF NATURALIZATION.

Petitions for naturalization filed and certificates of naturalization issued during the past year far exceeded in numbers those of any prior year since the Federal Government undertook the administration of the naturalization law. Of petitions, 95,627 were received, as compared with 42,178 in 1909, 55,038 in 1910, and 73,644 in 1911, while of certificates 69,965 were granted, as compared with 37,337 in 1909, 39,206 in 1910, and 56,257 in 1911.

The number of declarations filed was 169,142, as compared with 186,157 during the preceding year, showing a slight decrease, but the total number of naturalization papers of all three kinds increased from 316,058 in 1911 to 334,734 in 1912. The latter figures represent also an increase of 50.29 per cent since 1909, when the total was 222,727. The number of declarations of intention is of particular interest, as it indicates the number of petitions for naturalization which will ultimately be filed.

There are now 2,527 State and Federal courts exercising naturalization jurisdiction. These courts during the past year refused to grant citizenship to 9,635 petitioners, the causes of such refusals being various, including immoral character, invalidity of declarations of intention and petitions for naturalization, incompetency of witnesses, and lack of prosecution.

The naturalization fees received and covered into the Treasury during the past year amounted to $338,315.33, while the entire cost of the administration of the naturalization law was only $257,678.99.

Thus the Government derived from this source a net balance of $80,636.34.

Notwithstanding the slight increase in the personnel of the Division of Naturalization, overtime work has been required from its employees throughout the entire fiscal year. Realizing, therefore, the absolute necessity for a still larger force in the Division, the Department has submitted to Congress estimates for substantial increases in the administrative office in Washington and for a larger appropriation for the field examining force.

Recommendations previously made for a review by appeal or writ of error of the decisions of the courts of original jurisdiction in naturalization matters, and for the right to amend naturalization papers which have been improperly executed by clerks of courts, are renewed.

BUREAU OF CORPORATIONS.

REPORTS PUBLISHED.

The work of the Bureau of Corporations during the past fiscal year was almost wholly concerned with investigations already under way. The only new investigation undertaken was one on cotton tare, which required but a comparatively small amount of time.

On July 1, 1911, the Bureau published a summary of Part I of its Report on the Steel Industry, this part dealing with the organization, investment, profits, and position of the United States Steel Corporation. The full text of this part was issued in the following October.

On January 22, 1912, Part II (this being a preliminary report) of this report was issued. This part deals with the costs of production of certain selected products.

These reports received unusual attention, partly, no doubt, on account of the widespread interest in the affairs of the United States Steel Corporation. Part I was extensively used by the special committee of the House of Representatives which commenced an investigation of the affairs of that corporation in the spring of 1911.

On July 31, 1911, the Bureau published Part III of its Report on Taxation of Corporations, this part covering the Eastern Central States. This met with the same favorable reception that had been accorded previous parts of the report.

On September 25, 1911, Part II of the Report on the Tobacco Industry, dealing with capitalization, investment, and earnings, was issued. At that time plans for carrying out the dissolution of the Tobacco Combination in accordance with the decree of the Circuit Court of the United States for the Southern District of New York were being put into actual operation, and this attracted special attention to the report.

On March 14, 1912, the Bureau published its Report on Water-Power Development in the United States. The keen public interest in the control of this important natural resource is indicated by the fact that the edition was exhausted in a very few weeks after its publication. Owing to the present restriction in the law limiting the issuance of its reports to 2,500 copies a year, the Bureau has been unable to fill several hundred requests for copies. Supplemental issues of this and several other reports have been ordered under the current year's appropriation.

PENDING INVESTIGATIONS.

Among investigations on which work was still pending at the close of the fiscal year were those into the International Harvester Co., the lumber industry, transportation by water, the tobacco industry, and State taxation of corporations. A full report on costs of production of steel was also in the course of preparation, and the text of the report on cotton tare was being put in final shape.

RESULTS OF BUREAU'S WORK.

The results of the publications of the year have further demonstrated the value and real effectiveness of carefully prepared and analyzed information, given out from an official source. The repeated reference in the press to the Bureau's reports shows that the information thus crystallized in definite form is being used to advantage in molding public opinion on the great economic problems involved. Furthermore, these reports, by directing the attention of the public and also of the interests especially under investigation to particular evils, have had a marked corrective effect. Thus, the publication of Part I of the Report on the Steel Industry, which specifically condemned, among other things, the lease by the United States Steel Corporation of the extensive Hill ore lands and the high rates of transportation over its ore roads, was shortly followed by the cancellation of the said lease, to take effect January 1, 1915, and by substantial reductions in the ore rates complained of. It is true that this action of the Steel Corporation was taken almost simultaneously with the filing of the Government suit for the dissolution of that corporation; nevertheless, it appears that the discussion of these conditions provoked by the publication of the Bureau's report was instrumental in bringing about the changes noted. The Government suit, moreover, was largely based on the Bureau's findings.

During the year further effect of the Bureau's Report on Cotton Exchanges, issued in 1908 and 1909, was observable in a significant, although by no means complete, modification of the rules of the New York Cotton Exchange in the direction urged by the Bureau in that report.

TRADE COMMISSION IDEA.

During the past year there has been much discussion of proposed legislation for the establishment of a trade commission, which should succeed to, and considerably amplify the powers of, the present Bureau of Corporations. Several bills were introduced in Congress, but thus far this discussion has been productive of little net result, except to demonstrate the need of still further consideration of the subject.

Before such a body is established it is essential that some fundamental considerations be carefully weighed and settled. The powers of the present Bureau of Corporations are powers of inquiry and publicity, and in the exercise of these rather wide discretion is desirable, and, indeed, almost unavoidable. In dealing with powers of regulation, however, there must of necessity be a definition of these powers in the statute, and that definition presents a problem of vital importance. Perhaps the most serious danger involved in such a trade commission is the natural tendency to extend its authority. Even now some of the plans proposed contemplate extremely radical departures, as, for instance, the direct fixing of prices of commodities. Without further experience and without appreciation of the fundamental distinction between a public carrier and a private industry, it is proposed to clothe such a trade commission with substantially the same power which the Interstate Commerce Commission now exercises over railroad rates. Such fixing of prices is, of course, by no means a necessary accompaniment of a trade commission, and, in fact, the most carefully matured plans have not embraced this suggestion. Nevertheless, the fact that such propositions are seriously put forth demonstrates the necessity for extreme caution in framing legislation for the establishment of such a commission. Before reaching final conclusions, experience in this direction, especially that of various State commissions dealing with control of corporations, might well be investigated, either by a special commission or possibly by the Bureau of Corporations.

Next to the definition of the general powers of such a commission, the most important question involved is how far administrative discretion shall be conferred, or how far its functions shall be rigidly prescribed. At the outset, at least, it would seem that both the general powers and the degree of discretion should be carefully restricted. Instead of pressing Federal regulation as far as possible, the real desideratum in legislation affecting the country's business should be to preserve, to the greatest extent consistent with the public welfare, the element of self-regulation. The effort should be to lay down principles of conduct sufficiently specific to impose desired restraints, at the same time leaving a wide field for individual achievement.

Until the idea of a trade commission has been more thoroughly debated, both in the National Legislature and in the public press, the objects for which the Bureau of Corporations was created, namely, investigation and publicity, can well be served by the present policy of effective exposition of facts. For this work it is well fitted. The efficiency of the work of the Bureau, however, could be greatly increased by providing for the automatic submission by corporations engaged in interstate trade of certain fundamental data, such as facts as to capitalization, property, business, investment, profits, officers, directors, and controlling interests. The collection and compilation of such information, subject to due protection against unnecessarily disclosing matters of no real public concern, is directly in line with the policy of effective publicity, and would render such publicity more prompt than is possible under the present method of laborious investigation in each specific case, although extended investigations would still be necessary. There is at present a conspicuous absence of official information of even the elementary sort noted in a form available for general use, and its publication would be of general public interest. Such information would, moreover, further increase the value of the Bureau's work in laying the foundation for such constructive legislation as may eventually be deemed necessary, whether or not this involves the establishment of a trade commission.

ASSISTANCE IN CORPORATE REORGANIZATION.

It has been suggested that a trade commission, if formed, should be authorized to act in an advisory capacity to the Federal courts, at their request, in connection with the formulation of plans for the reorganization of corporations found to be in violation of the Sherman law. It would seem that the Bureau as at present organized could render valuable service in this respect, although its assistance might with propriety be specifically authorized by statute. Any plan of reorganization looking to the restoration of active competitive conditions in a great industry, especially where the dissolved corporation controls a very large percentage of the business, depends, for its effectiveness, as much on an intimate knowledge of the conditions in the industry as on questions of law. The knowledge possessed by the Bureau's experts, together with the specific information gathered in its painstaking investigations, should be of substantial value in such reconstructive work.

BUREAU OF LABOR.

REPORTS PUBLISHED.

During the fiscal year ended June 30, 1912, Volumes I and II of the Report on Conditions of Employment in the Iron and Steel Industry in the United States (S. Doc. 110, 62d Cong., 1st sess.), made

in compliance with a resolution of the Senate, were issued by the Bureau. These volumes relate to wages, hours of labor, and days worked, and cover practically every important plant in the industry in the United States. In addition to these volumes seven volumes of the Report on Condition of Woman and Child Wage-Earners in the United States (S. Doc. 645, 61st Cong., 2d sess.) were issued by the Bureau. These volumes contain a portion of the results of an investigation of this subject made in compliance with an act of Congress, and their titles are as follows:

Volume IX. History of Women in Industry in the United States.
Volume X. History of Women in Trade Unions.
Volume XI. Employment of Women in the Metal Trades.
Volume XII. Employment of Women in Laundries.
Volume XV. Relation between Occupation and Criminality of Women.
Volume XVI. Family Budgets of Typical Cotton-Mill Workers.
Volume XVII. Hookworm Disease among Cotton-Mill Operatives.

BIMONTHLY BULLETINS.

The bulletins of the Bureau issued during the year contained, in addition to special articles, decisions of courts affecting labor and laws of various States and of the United States relating to labor.

The special articles included in the bulletins are as follows:

Bulletin 95. Industrial lead poisoning in Great Britain and the western states of Europe; White-lead industry in the United States; Deaths from industrial lead poisoning in New York State in 1909 and 1910.

Bulletin 96. Working hours, earnings, and duration of employment of women workers in selected industries of Maryland and of California; Employment of children in Maryland industries; Attitude of Massachusetts manufacturers toward the health of their employees; Workmen's insurance code of July 19, 1911, of Germany.

Bulletin 97. Review of labor legislation of 1911; Laws of various States relating to labor enacted since January 1, 1911.

Bulletin 98. Mediation and arbitration of railway labor disputes in the United States; Canadian Industrial Disputes Investigation Act of 1907; Conciliation and arbitration of railway labor disputes in Great Britain; Conciliation and arbitration in Great Britain; Attitude of employing interests toward conciliation and arbitration in Great Britain; Attitude of labor toward conciliation and arbitration in Great Britain; Conciliation, arbitration, and sanitation in the cloak, suit, and skirt industry in New York City; Industrial courts in France, Germany, and Switzerland.

Bulletin 99. Wholesale prices, 1890 to 1911.

Bulletin 100. List of industrial poisons and other substances injurious to health found in industrial processes; Act providing for a tax on white phosphorus matches and for prohibiting their import or export.

REPORTS TRANSMITTED AND IN COURSE OF PREPARATION.

The report on the miners' strike in the bituminous coal field of Westmoreland County, Pa., in 1910–11, was transmitted to the House of Representatives June 20, 1912. The report on the strike of textile

workers in Lawrence, Mass., which occurred early in 1912, was transmitted to the Senate June 25. Each of these reports was made in conformity with a congressional resolution.

Volume III of the Report on Conditions of Employment in the Iron and Steel Industry, relating to working conditions and the relations of employers and employees, and Volume IV of the same report, relating to accidents and accident prevention, have been transmitted to the Senate and are now in press.

In addition to the fifteen volumes of the Report on Condition of Woman and Child Wage-Earners in the United States which have been issued the following volumes have been sent to the printer and will be ready for distribution in a short time:

Volume XIII. Infant Mortality and its Relation to the Employment of Mothers.

Volume XIV. Causes of Death among Woman and Child Cotton-Mill Operatives.

Volume XIX. Labor Laws and Factory Conditions.

The text for Volume XVIII of this report, which relates to the employment of women and children in selected industries, is now being prepared and will soon be ready for the printer. This will complete the series of nineteen volumes.

The publication of the series of annual and special reports and of bimonthly bulletins has been discontinued and beginning with July, 1912, a bulletin will be published at irregular intervals, each number of which will be devoted to one of a series of general subjects as follows:

Wholesale prices.
Retail prices and cost of living.
Wages and hours of labor.
Women in industry.
Workmen's insurance and compensation (including laws relating thereto).
Industrial accidents and hygiene.
Conciliation and arbitration (including strikes and lockouts).
Labor laws of the United States (including decisions of courts relating to labor).
Foreign labor laws.
Miscellaneous series.

The bulletins will be numbered consecutively in each series and will also carry a consecutive whole number beginning with No. 101.

The report on retail prices of food and wages in the principal industries in the United States, covering the period 1890 to 1911, is now in press and will be published as a bulletin in the series "Retail prices and cost of living." A second bulletin in this series, also in press, brings the information regarding retail prices of food and wages down to and including June, 1912. Other bulletins which

have been transmitted to the printer relate to the following subjects: Care of tuberculous wage earners in Germany; lead poisoning in potteries, tile works, and porcelain enameled sanitary ware factories, and workmen's insurance laws of Great Britain, Germany, and Switzerland.

Reports on the employment of women in the canning industry in Wisconsin and in laundries in Milwaukee will be ready for the printer in a short time and work is going forward in connection with the study of conciliation and arbitration in the building trades in New York City. An investigation of accidents in the foundry and machine-shop industry similar to that on accidents in the iron and steel industry is also in progress, and in addition further statistics of accidents in the iron and steel industry will be collected in order that comparative figures on this subject may be secured for a series of years.

GOVERNMENT WORKINGMEN'S COMPENSATION ACT.

Under the act of May 30, 1908, providing for compensation for injuries to certain employees of the United States, 2,080 claims for compensation were received during the year ended June 30, 1912, besides 15 cases pending July 1, 1911. Of these 2,095, 77 were claims for compensation on account of deaths of employees, of which 60 were found to be established, 8 were not allowed, and 9 were pending at the close of the year. The cases in which death did not result were 2,018 in number, of which 1,854 were found to be entitled to compensation, while in 97 cases the claim for compensation was not supported and 67 cases were pending at the end of the year.

In connection with the administration of the compensation act, provision is made for reporting injuries to all classes of employees of the Government which occur in the course of employment when the injury causes disability for one day or longer or results in death, without regard to the scope of the compensation act. The total number of accidents thus reported was 4,389, including 114 reports of accidental death.

The above totals do not include cases of injury to employees of the Isthmian Canal Commission where the resultant disability was of less than 15 days' duration; neither do they include injuries or claims arising since March 3, 1911, on account of accidents to employees of the Isthmian Canal Commission, the administration of the law in respect to such employees having been transferred to the Commission on that date.

Various amendments to the law were proposed during the last session of Congress, of which but two were adopted. These amendments provide that the law shall apply to any artisan, laborer, or other employee engaged in hazardous work under the Bureau of Mines, the Forestry Service, and the Lighthouse Service.

CHILDREN'S BUREAU.

By "An act to establish in the Department of Commerce and Labor a bureau to be known as the Children's Bureau," approved April 9, 1912, Congress provided for the organization of the twelfth separate bureau under the jurisdiction of this Department. The functions of the new bureau as recited in the law are to investigate and report on all matters pertaining to the welfare of children and child life among all classes of our people, and especially to investigate the questions of infant mortality, the birth rate, orphanage, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, and legislation affecting children in the several States.

The law is not designed to encroach on the right of States or to relieve them from the duty of dealing with this subject, but to furnish information to enable them to deal with it more successfully. It also presumes that there is a duty on the part of the National Government to aid in getting information and data with a view to assisting in this work and that the Government can get such information and data more effectively than the respective States.

BUREAU OF MANUFACTURES.

The Bureau of Manufactures again reports a year of satisfactory growth in its service of investigation and publicity in behalf of commerce.

The work of this Bureau is perhaps more closely related than any other branch of the Government to the primary function of promoting the commerce of the United States. Appreciation of the facilities of this service is shown by constantly increasing demands upon it, this increase reaching 45 per cent in the fiscal year 1912 as compared with 1911.

PUBLICITY.

The Daily Consular and Trade Reports are now issued to the full limit of 20,000 copies permitted by the existing law, and there are hundreds of applications for this journal on file. The Bureau is seriously embarrassed by its inability to comply with these legitimate requests, and it is urged that action be taken by Congress to authorize a larger edition. Distribution of these reports should not be unduly restricted. The demand for the special bulletins and reports of the Bureau is also increasing. This demand can be supplied in part through the office of the Superintendent of Documents, since several of the publications now have a continuing sale. Packing for Export, Factors in Foreign Trade, the World Trade Directory, and other bulletins are in steady demand by purchasers. Sixteen consular and special agents' reports and 139 confidential bulletins and circulars

were issued during the year. The number of single copies of the various publications of the office distributed reached a total of considerably over 5,500,000.

NATIONAL COMMERCIAL CONFERENCE.

This Bureau, at my direction, in April, 1912, transmitted to over 1,100 commercial organizations in the United States an invitation to send representatives to a conference called by the President to consider the establishment of a national commercial organization broadly representative of all the commercial interests of the United States. The need for coordination of the unrelated efforts of chambers of commerce, boards of trade, and similar associations in the field of trade promotion has long been recognized, and the time seemed opportune to aid the founding of such a national body.

As a result of the very successful meeting, which was held in Washington on April 22 and 23 and attended by 700 delegates from 400 commercial associations in every part of the United States, the Chamber of Commerce of the United States of America was organized.

DIVISION OF FOREIGN TARIFFS.

The duty of furnishing "information to Congress and the Executive relative to customs laws and regulations of foreign countries," first assigned to the Bureau of Manufactures by the act making appropriatons for legislative, executive, and judicial expenses of the Government for the fiscal year 1911, became of paramount importance during the last fiscal year, because of the many measures under consideration in Congress that required, for their careful study, a knowledge of foreign legislation. Comprehensive statements were prepared by the Division of Foreign Tariffs for committees of Congress, for the Tariff Board, and for other branches of the departmental service, showing the import duties on manufactures of metal, cotton manufactures, sugar, and tobacco and the restrictions on the importation and sale of oleomargarine in foreign countries.

The rapid expansion of trade between the United States and Latin-American countries gives rise to many inquiries concerning the various charges incident to the entry of merchandise in those countries. Their intricate tariff systems and the numerous additional duties and other charges imposed made it advisable to undertake a comprehensive investigation of the subject in all its branches. The investigation was intrusted to the Chief of the Division of Foreign Tariffs, who, in the capacity of commercial agent, visited most of the capitals and chief ports of South America during the last six months of the fiscal year. Full information concerning actual customs practice in each of the countries visited, obtained both from

customs officials and from the principal importers of American manufactures, is embodied in a series of reports in course of publication in the Daily Consular and Trade Reports. These reports will later be collected in a monograph.

The special work to which reference has already been made, together with the increasing volume of correspondence as manufacturers are coming to make fuller use of the tariff information on file in the Bureau, has necessarily curtailed the publications of the year. Nevertheless, the Customs Tariff of Japan was prepared for publication, several supplements to earlier numbers of the Tariff Series were issued, and a large number of items concerning tariff changes were inserted in the Daily Consular and Trade Reports and reprinted in Foreign Tariff Notes.

The work of the Bureau should be extended to cover the entire field of foreign legislation affecting industrial and commercial interests. The official publications of foreign countries, which, to the number of a thousand a month, are regularly read for tariff changes and customs regulations, contain an immense fund of information outside that limited field. To collate properly the laws, regulations, and judicial decisions concerning trade-marks, patents, copyrights, sanitary restrictions, and other subjects of economic legislation, so as to make them readily available both to the business interests of the country and to Congress and the executive departments, would require the services of experts in the various lines, and these new subjects of investigation, notwithstanding their importance, can not therefore be undertaken until adequate funds are provided for that purpose.

It is apparent that the information distributed by the Division of Foreign Tariffs will always be in current demand by commercial interests and that a permanent service must be maintained in this field.

COMMERCIAL AGENTS.

The services of the commercial agents of the Department, under the direction of the Bureau, have covered a wide range of investigations during the year. The trade in cotton and cotton textile manufactures, leather and boots and shoes, machinery and tools, chemical manufactures, lumber products, and electrical instruments received the attention of trained investigators in each field, and in addition studies were made of the systems of granting foreign credits, the methods of packing and shipping cotton, the development of the work of commercial organizations in the United States, and the commerce of the Orient. Reports on nearly all of these subjects have already been issued.

The Department urges, in view of the admitted success of this branch of its service, that Congress recognize it as an essential in-

strument in the development of the Bureau's usefulness. Statutory authority should be given for its establishment as a permanent division of the office, especially in view of the assignment to the new Bureau of Foreign and Domestic Commerce of duties in connection with the investigation of costs of production and similar matters. At present the work depends on annual appropriations which may at any time be withheld, and there is no formal authorization by statute for the logical development of a permanent service of field agents for commercial promotion.

Other nations make such service an integral part of their systems of trade development. It is believed that the United States should realize that in its competition with other great exporting nations these trained commercial investigators are certain to be a factor of continuing and increasing importance. Furthermore, some assurance of permanent employment is needed to attract to this work the type of man who is equipped for successful service, and this assurance can not be given under the existing conditions.

FACILITIES OF THE BUREAU.

It is very evident that the recent legislation materially increasing the scope of the combined Bureaus of Manufactures and Statistics will render the Bureau of Foreign and Domestic Commerce one of the most important branches of this Department. The possibilities of growth and service, already large, are much enhanced through this legislation, and it would seem the part of wisdom to make adequate preparation for the demands which are certain to be made by the commercial public upon this office. Its facilities are now inadequate to meet the present demands, and do not permit the intelligent and reasonable extension of service in many directions where opportunities exist for the legitimate exercise of the functions assigned to the Bureau.

There is already a vast amount of useful trade information in the files, much of which remains unused because of the limitations imposed through inadequate equipment and limited personnel. The editorial division of the Bureau should be strengthened in numbers, its library and system of reference files should be given additional employees, a section of trade-directory information should be begun, a section devoted to the work of what may be called "commercial expositions" is needed, and its printing fund and equipment for distributing important trade opportunities should be made adequate.

I feel justified in urging earnestly the generous support of this Bureau. I am convinced that the money expended in this work is returned to the nation many times over in the betterment of our trade, both foreign and domestic.

BUREAU OF STATISTICS.

EXPORTS OF MANUFACTURES.

The statistics of our foreign trade during the past year fully justify the statement made in this report two years ago that our export trade must be represented more and more by manufactures, and our import trade by manufacturers' materials. The work of the Bureau of Statistics, which during the entire period of its existence has been devoted to the compilation and analysis of statistics of our import and export trade, brought out this fact last year more clearly than ever before.

The report of this Department for 1910 stated that "it is apparent that the great growth in importations which has characterized our commerce in recent years is largely due to an increasing demand for materials from abroad for use in the manufacturing industry; it is equally apparent that the chief growth in exportation is in manufactures, which have increased about 60 per cent in the last decade, while foodstuffs have declined about 30 per cent." This statement as to the trend of our foreign commerce, as evidenced by the figures furnished by the Bureau of Statistics, is equally true of the commerce of the United States during the fiscal year 1912. The share which manufactures formed of the exports in 1912 was larger than ever before, and the total value of manufactures exported was also larger than in any preceding year. Manufactures ready for consumption formed 30.98 per cent of the exports of the fiscal year 1912, against 29.72 per cent in 1911, the former high record in the value of exports of finished manufactures and in the share which they formed of the total exports of domestic products. Manufactures for further use in manufacturing formed 16.04 per cent of the exports of the year, against 15.35 per cent in 1911 and 15.66 per cent in 1910. Thus, manufactures (combining the two groups, those ready for consumption and those for further use in manufacturing) formed 47.02 per cent of the exports of 1912, against 32.48 per cent a decade earlier, in 1902, and 18.02 in 1892.

The total value of manufactures exported exceeded, for the first time, one billion dollars in the fiscal year 1912, exports of manufactures ready for consumption having been $672,268,163, against the former high record of $598,367,852 in 1911; and those of manufactures for further use in manufacturing $348,149,524, against the former high record of $309,151,989 in 1911. A comparison of 1912 with a decade earlier shows an increase of 109 per cent in the exportation of manufactures ready for consumption and of 164 per cent in manufactures for further use in manufacturing, the figures of 1902

having been $321,946,540 for manufactures ready for consumption and $131,918,311 for manufactures for further use in manufacturing.

The increase in exports of manufactures occurred chiefly in manufactures of iron and steel, leather and manufactures of leather, manufactures of cotton, mineral oil in its various forms, cars and carriages, and copper.

EXPORTS OF FOODSTUFFS AND MANUFACTURERS' RAW MATERIALS.

The decline in exportation of foodstuffs, to which attention was called in this report two years ago, continues, the total value of the exports of this class having been, in 1912, $418,737,763, against $513,617,739 in 1902, a decade earlier. Manufacturers' raw materials (chiefly cotton) continues to show a slight gain in the export trade, having been $723,008,839 in 1912, against $713,018,206 in 1911, forming, however, but 33.31 per cent of the total exports of 1912, against 35.42 per cent in the preceding year. This decline was, however, due to a reduction in prices of cotton, the quantity of that article exported having increased about 37 per cent while the total value fell about 3.3 per cent.

Foodstuffs formed in 1912 but 19.29 per cent of the total exports, against 37.90 per cent in 1902 and 50.50 per cent in 1892. This is due in part to a decline in the surplus food materials available after supplying domestic requirements and in part to the increase in exports of manufactures and manufacturers' materials. The quantity of wheat exported in 1912 (including that sent in the form of flour) was but 79,700,000 bushels, against 147,700,000 bushels in 1907, five years earlier, and 234,800,000 bushels in 1902, ten years earlier. The other principal class of foodstuffs exported, meat and dairy products, amounted in value to but $156,260,876 in 1912, against $210,990,065 in 1906. This falling off occurred especially in beef, of which the United Kingdom, the chief European importing country, now draws her supplies largely from Argentina. British statistics show that in 1901 the United States supplied 70.5 per cent of the fresh beef imported into the United Kingdom, while in 1911 it supplied but 2.4 per cent of the total, Great Britain's imports of fresh beef from Argentina having grown from 103,000,000 pounds in 1902 to 684,500,000 pounds in 1911, while those from the United States have fallen from 257,000,000 pounds in 1902 to 19,500,000 pounds in 1911. Our own figures of exports of fresh beef to that country show a fall from 298,000,000 pounds in the fiscal year 1902 to 8,900,000 pounds in 1912.

DESTINATIONS OF EXPORTS.

The growth in exportation is especially marked in the trade with our neighbors on the North American continent. The official figures

of the Canadian Government show that 61.7 per cent of its imports in the fiscal year 1911 were drawn from the United States; those of Mexico show 54.9 per cent of its imports from the United States; Cuba, 52.8 per cent, and the Central American States about 50 per cent. The value of manufactures ready for consumption exported to North America increased from $219,563,459 in 1911 to $252,551,636 in 1912, and those to South America from $75,926,592 to $89,816,596; an increase of $46,878,181 in exports of this group to North and South America as a whole; while to all Europe the increase in exports of finished manufactures during the same period was but $20,653,903; to Asia, $2,374,082; and to Oceania, $3,945,520. In manufactures for further use in manufacturing the increase in exports to North and South America combined was also greater than that to Europe, the gain in those to Europe having been $15,292,317 and those to all America $18,890,287, of which $11,455,816 were in those to North America and $7,454,471 in those to South America.

North America is now the largest customer among the grand divisions for our finished manufactures, the exports of manufactures ready for consumption to North America in 1912 having been $252,551,636; to Europe, $206,783,275; to South America, $89,816,596; to Asia, $54,855,082; to Oceania, $52,799,575; and to Africa, $15,461,999. Naturally Europe is the largest purchaser of manufactures for further use in manufacturing, the total exports of this group to Europe in 1912 having been $225,744,771, against $73,128,248 to North America, $25,576,931 to South America, $11,711,380 to Asia, $9,662,171 to Oceania, and $2,326,023 to Africa. The record of manufacturers' crude materials exported shows a fall in value in the movement toward Europe and a marked increase in the movement to North America and Asia. The value of crude materials for use in manufacturing exported to Europe was $597,663,284 in 1912, against $619,883,819 in 1911; to North America, $81,523,691, against $72,114,801 in 1911; and to Asia $36,236,240, against $14,831,130 in 1911, the marked gain in this class of material exported to Asia being chiefly due to large increases in the quantity of cotton exported to Japan. The falling off in the value of manufacturers' crude materials exported to Europe also occurred chiefly in cotton. The decrease in exports of manufacturers' crude materials to Europe and the increase in the exports of the same group to Asia are traceable to a single cause, the decline in the price of raw cotton. The marked fall in the price of raw cotton led to a very large increase in the exports to Japan—240,467,144 pounds in 1912, against 78,361,901 pounds in 1911—and while a considerable increase also occurred in the exports to Europe the gain in quantity was not sufficient to offset the reduction in value due to the lower export prices in 1912.

CHARACTERISTICS OF IMPORT TRADE.

On the import side the most striking characteristics of the year's trade are a large increase in manufacturers' materials brought into the country and an unusually large quantity of merchandise entering free of duty. The value of crude materials imported for use in manufacturing in the fiscal year 1912 was $555,986,041, against $303,001,868 in 1902, a decade ago; and of manufactures for further use in manufacturing, $293,739,134, against $147,656,292 in 1902, the value of manufacturers' materials imported having thus practically doubled in the decade. Even more striking is the large proportion of the imports which entered free of duty. Of the $1,653,264,934 worth of merchandise imported in the fiscal year, $881,670,830 entered free of duty, against $396,818,871 in 1902, a decade earlier. Thus the value of nondutiable merchandise entering the country has considerably more than doubled during the decade and the share which duty-free merchandise forms of the total has grown from 43.93 per cent in 1902 to 53.33 per cent in 1912. Adding to this total the free merchandise entering from Hawaii and Porto Rico, the grand total of merchandise entering continental United States free of duty aggregated nearly one billion dollars in the fiscal year 1912, and in the current year seems likely to exceed one billion dollars.

The imports of finished manufactures show a slight decline in 1912 when compared with those of other recent years, while the percentage which finished manufactures form of the total imports shows a decided reduction. The total value of manufactures ready for consumption imported in the fiscal year 1912 was $360,018,963, against $367,723,367 in 1910, while the share which this class of articles formed of the total imports in 1912 was 21.78 per cent, against 23.62 per cent in 1910 and 27.77 per cent in 1908. Manufactures for further use in manufacturing show a larger total in the import trade of 1912 than ever before, the value having been twice as great in this class as a decade ago. The principal articles forming this group are pig tin, pig copper, lumber, diamonds, spun silk, and certain classes of chemicals, drugs, and dyes used in manufacturing.

The fact that manufactures still show a large total and form a considerable percentage of the imports, and that a large proportion thereof is composed of silk goods, woolen goods, cotton laces, linen handkerchiefs, and burlaps and other fiber products, suggests that there are still great opportunities awaiting the manufacturers of the United States in supplying those requirements of daily life for which our people now depend upon the manufacturing industries of other countries.

GROWTH IN MANUFACTURING INDICATED BY FOREIGN TRADE STATISTICS.

The entire trade movement of the year, whether imports or exports, indicates unusual activities on the part of the manufacturing industries of the country. The quantity and value of manufacturers' materials imported, whether in the natural state or partly manufactured, are greater than in 1911, and the quantity and value of manufactures exported are greater than ever before; while the percentage which manufacturers' materials imported and manufactures exported, respectively, form of the import and export totals is unusually large.

TRADE WITH NONCONTIGUOUS TERRITORIES.

Trade with the noncontiguous territories of the United States (in which term are included Porto Rico, Hawaii, the Philippine Islands, Guam, Tutuila, and Alaska) shows a continuation of the rapid growth of recent years. The shipments from the United States to those territories show in each case larger values in 1912 than in any earlier year, the total for the entire group being $106,355,529, against $92,609,596 in 1911. The value of merchandise received from them is $142,984,734, against $107,527,827 in 1911. These figures are exclusive of gold, of which the value of the domestic product from Alaska in the fiscal year 1912 is $17,250,019, against $15,153,671 in the preceding year. Manufactures form the principal articles sent to the noncontiguous territories; sugar and fruits the chief articles received from the Hawaiian Islands; sugar, cigars, tobacco, and fruits from Porto Rico; hemp, sugar, and cigars from the Philippine Islands; and fish, furs, copper, and gold from Alaska.

TRAFFIC VIA ISTHMUSES OF PANAMA AND TEHUANTEPEC.

The approaching completion of the Panama Canal lends special interest to figures compiled by the statistical service of this Department, showing already marked increases in the traffic between the eastern and western coasts of the United States by way of the isthmuses of Panama and Tehuantepec. These figures show that this traffic has trebled in value during the last four years, having been $125,000,000 in value in the fiscal year 1912, against $36,000,000 in 1908, the first fiscal year following the opening of the Tehuantepec Railway. These figures relate exclusively to traffic between the eastern and western coasts of the United States, including Porto Rico (now a customs district of the United States) on the east and Hawaii (also a customs district of the United States) on the west. The class of articles moving from the eastern to the western coast is chiefly manufactures, and of those moving from the western coast and Hawaii sugar, fruits, canned vegetables, canned salmon, wool, copper ore, and wines.

DEFICIENCIES OF THE STATISTICAL SERVICE.

The increase in the industrial activity of the country results in increased demands upon the Bureau of Statistics for commercial information and especially for greater detail and greater promptness of statement. The manufacturers of the country require information regarding the imports and exports of a great variety of articles, the world markets in which our manufactures are being sold, and the countries from which the materials which they require are being imported. This information they desire not only in great detail, but with promptness, and this need on the part of this important element of the community—the manufacturing interests—renders advisable an increase in the working force of the customhouses which supply the statements upon which the statistics of our commerce are necessarily based and also in the working force of this Department devoted to the compilation and analysis of this information.

This matter of increased detail, accuracy of statement, and promptness of presentation of statistics of imports and exports and internal commerce movements has been the subject of a special study made by committees of the Treasury Department and the Department of Commerce and Labor during the past year, to which reference has been made in an earlier part of this report.

BUREAU OF STANDARDS.

During the past year the activities of the Bureau have resulted in a larger number of published papers than heretofore. The results of 35 scientific and technologic investigations have been issued. The staff consisted of 192 scientific and other assistants, of whom about 80 were engaged upon special researches and investigations specially authorized by Congress. About 73,196 tests were made in addition to the researches completed and in progress during the year. The inspection work at the factories was developed for both cement and electric lamps, about 1,000,000 barrels of cement having been sampled and 2,000,000 electric lamps inspected at the factories. The development of standard specifications for various materials has proceeded steadily in cooperation with the national technical societies and the various departments of the Government. These will go far toward establishing definite standards of quality based upon the measured properties of the materials involved and thus benefit alike the manufacturer and the user of the materials. As heretofore, the demands for special investigations connected with standards, methods of measurement, and the properties of materials are more than can be met with the assistants available. The Bureau has been constantly called upon as referee and consultant by various depart-

ments of the Government, and for information and aid by public-service corporations and public-utilities commissions. As far as possible it has responded to these requests.

CUSTODY OF THE STANDARDS.

One of the principal functions of the Bureau is the custody of the standards available for the measurement of the various aspects and properties of matter, energy, and motion, and their relations. While the fundamental standards are few in number, the derived standards—such as standards of light, color, composition, combustion, and other quantities which are developed as industrial and scientific needs multiply—steadily increase in complexity. The maintenance of such standards becomes an important part of the Bureau's work. The proper custody of the standards requires constant temperature rooms, thermostatic regulation, and frequently protection from moisture and other atmospheric conditions; so that, in order to secure the best conditions for constancy and permanency, special investigations are made as to every factor affecting the standards. The reason is obvious when it is known that even standards of length and mass are subject to appreciable alterations. Systematic changes in standards are among the most trying difficulties to be overcome. Constant intercomparisons combined with the steady control of conditions of maintenance and the international interchange of standards form the basis on which the requisite constancy may be maintained. The tendency of even fundamental standards to alter in their indications makes their maintenance a continual series of checkings and the prompt substitution of new standards for those found drifting in their values. The standards of reference are rarely used for ordinary work, such comparisons being made through secondary standards checked from time to time with the reference standards.

COMPARISON OF THE STANDARDS.

The national standards of weight, length, and capacity are now available for the service of the public through standards furnished each State in the Union and by accurate reverification from time to time. The Bureau also verifies the standards used in all branches of industry, science, and technology, thus ensuring a common standard of measure by direct reference to the national standards, a prerequisite to efficiency and progress in these fields. The reference to a single standard for each measure alone permits the prompt application of scientific discovery to industry. Such comparisons require elaborate facilities and apparatus, skilled technical assistants, and direct access to the standards to attain the best results. It is necessary also to keep in close touch with scientific progress in all parts

of the world in the subject of measurement. During the decade since the Bureau was founded by Congress apparatus and methods of comparison have been developed or improved for nearly every kind of physical measurement, and steady progress is made by the Bureau to keep pace with advances in science. Instances of such activity during the past year may be cited in this connection.

The newly awakened interest in correct trade measures resulted in heavy demands for the testing of State standards. During the past year the Bureau tested standards for Connecticut, Indiana, Arizona, Minnesota, Montana, Nevada, New Jersey, Pennsylvania, Vermont, and Wisconsin, and numerous cities.

The standardization of primary standard mercurial thermometers in the range 100° to 500° C. is still in progress. These standards are the practical basis of the ordinary temperature scale for the country. To obtain close international agreement in the standard scale of temperature, the Bureau has made comparisons of platinum resistance thermometers with the nitrogen gas thermometer up to 630° C.

During the year the Bureau has standardized the Pentane lamps used in various cities to test the illuminating power of gas, has shown the need for such work, and an increased demand for tests of flame standards has resulted. The Bureau certified a larger number of such standards than in all previous years combined. Each test provides a standard by which the entire gas supply of a city may be maintained at standard lighting power.

The reference color standards used in the inspection of cotton oil are being standardized. Extended comparisons of direct midday sunlight with the acetylene flame has shown that sunlight is a satisfactory constant working standard for an ideal white light.

Standard magnetic test bars have been loaned to educational institutions to enable them to check their magnetic measuring instruments. This will promote uniformity in such measurements. The cooperation of national technical societies has been secured for both experimental work and the consideration of specifications for magnetic standards and tests.

The Bureau must steadily extend its comparisons to include standards for which facilities and assistants are still lacking. The systematic comparison of industrial standards with the fundamental standards will greatly aid industrial development.

CONSTRUCTION OF STANDARDS.

It is necessary that the Bureau construct standards whenever improved methods are ascertained or developed at the Bureau or as standards deteriorate. In some cases standards have not heretofore been available and must be developed. This usually involves scientific investigations of the most advanced character, since the perfec-

tion of such standards should be in advance of the technical requirements in science and in industry.

Standards of electric resistance and electromotive force have been investigated to make them more trustworthy. The silver voltameter investigation to fix the primary unit of current is completed and the results are now in press. The electric balance, by which the electric current is weighed and the unit of current independently ascertained, has been perfected to a high degree of accuracy and the completed results of an extended determination are being prepared for publication. These researches upon the fundamental electrical units and standards involve the utmost instrumental refinement, the development of the rigorous methods of measurement, and painstaking study of the theory of such measurements, as well as extended experimental work covering several years. The completion of these researches marks a notable advance in electrical measurements, upon which the progress of electrical science and industry so largely depends.

A number of the standards of electric resistance of the sealed type devised at the Bureau are sent each year to the several national laboratories of Europe. The comparisons of these standards show a high degree of concordance, the difference not exceeding 1 part in 30,000. The close agreement is due largely to the Bureau's method of sealing such standards to avoid the effects of humidity. The Bureau prepares standards of light—incandescent electric lamp standards (both carbon and tungsten) of certified illuminating value, and also standard color screens. Through standardized lamps the primary unit of light of the Bureau is maintained. Such standardized lamps are also sold to the public.

Vacuum tubes of improved design filled with pure rare gases have been supplied in increasing numbers to various optical laboratories for use as standard light sources for technical purposes. These tubes have developed remarkable practical uses for the optical properties of the inert components of the atmosphere. A great number of card and glass reference standards of color have been standardized and certified. Methods of color analyses applicable to industrial products have been developed.

Standards of composition for various irons, steels, and other materials are prepared, analyzed, and certified by the Bureau. These are distributed to the public for a small fee and serve to check the correctness of the methods of industrial analyses and the skill of the analysts. More than 30 accurately analyzed materials are now available for distribution. Three new standards of special steels, namely, nickel, chrome-nickel, and chrome-vanadium steel, were prepared for distribution during the year. Other standard materials are in preparation, including sodium oxalate, for use as a standard for oxidimetry, and benzoic acid as a standard for acidimetry. During the year 168

standards of combustion were prepared for chemists and engineers for standardizing calorimeters and to check the accuracy of the methods of determining the heating values of fuels. The materials include pure sugar, napthalene, and benzoic acid of exceptional purity and ascertained heating value, certified in each case by the Bureau.

TESTING OF STANDARD MEASURING APPARATUS.

During the past year a great variety of standard measuring apparatus has been compared and, in many cases, new methods of measurement have been developed of greatly increased precision. It is essential that the Bureau keep in advance of the needs of science and industry in rigor of methods and precision of results. Among the important work of the year may be mentioned the following:

The experimental study of the properties of electric condensers has been continued with excellent results. From a detailed study of the theory of the moving-coil galvanometer it has been found possible, after five separate measurements, to compute the constants and performance of such instruments accurately. These data will greatly aid in the selection of suitable instruments for special purposes. Improved methods and apparatus for magnetic measurements have been devised for testing specimens larger or smaller than standard sizes, greatly enhancing the range and usefulness of this work. The Bureau has designed, constructed, and tested new apparatus for testing electric potentiometers. A technical study of the theory of the corrections to such apparatus has been completed which will place this work upon a more exact basis.

More than 3,000 tests of standard weights were made for the National and State Governments and for technical laboratories. The standardization of fine-mesh sieves used in testing cement was thoroughly investigated, new specifications developed for the Government, and new and accurate methods of measuring the mesh of such sieves devised by the Bureau.

The field investigation of commercial weights and measures of the United States was concluded during the year. The investigations covered every State in the Union and was made by experienced inspectors, and was the first general investigation of the weights and measures throughout the United States. The results were furnished in manuscript to the States where pending legislation called for a study of the needs for adequate inspection service. Already the investigation has resulted in the passage of many State laws upon the subject. The Bureau cooperates with the States in framing the text of the technical details of such legislation, though the Bureau force is inadequate to meet the demand. This cooperation has been appreciated by the States. The investigation is being summarized in a report soon to be published. A startling proportion of the meas-

ures of daily trade were found incorrect, e. g., scales, 44.53 per cent; weights, 15.9 per cent; dry measures, 48.5 per cent; and liquid measures, 28.2 per cent.

A notable improvement is now found in American-made glass volumetric measuring apparatus submitted to the Bureau for test. The rigid specifications of the Bureau have done much to raise the standard of such volumetric apparatus until it is now superior in some respects to the best foreign product. Practically all volume and density measuring apparatus used in Government laboratories is now ordered on Bureau of Standards specifications and tested by the Bureau. More than 9,000 capacity measures were tested during the year. Aneroid barometers, for altitude indications, were studied in great detail during the year, as to their behavior under mechanical test, temperature variation, atmospheric conditions, and air-pump tests. Elaborate observations were made as to each factor involved. As a result, the Bureau will undertake at the request of Government departments and of manufacturers the development of a standard specification for aneroid barometers. Methods and apparatus were developed for precision testing of mercurial barometers and with a rapidity consistent with satisfactory results.

Nearly 18,000 thermometers were tested by the Bureau during the year. These include standards used to determine the heating value of fuels, primary standards used to define the standard temperature scale, mercurial thermometers, clinical thermometers used by the medical profession, electrical resistance thermometers, and thermocouples. A gas calorimeter test was made for public-service commission use. Such work will increase in importance in view of the changing legal requirements for the sale of gas. The heat tests also included the determination of specific heats of special distillates, the heats of combustion of engine oil, and a by-product of oil gas. The testing of high-temperature measuring instruments increased about 60 per cent over that of the preceding year. These comprised platinum resistance thermometers, pyrometer galvanometers, and optical and radiation pyrometers.

A new, rapid, and precise instrument for determining reflecting power has been perfected, used in testing at the Bureau, and made available to the public. Many quartz plates for the daily control of saccharimeters used in sugar testing have been certified for the use of the Government and the general public. More than 1,300 polarimetric and other optical tests were made during the year.

Radiometry is one of the newer sciences which are immediately applicable industrially. A bulletin was prepared giving the advances in the design and construction of radiometric apparatus. The many inquiries which were being received from specialists and others made such a paper especially timely.

PROBLEMS CONNECTED WITH STANDARDS.

Extended tests of certain classes of electrical measuring instruments were made by the Bureau for the makers to show where improvements were needed. Such comparisons go far to advance the art of measurement and the results are of great value to manufacturers. A new method has been devised for testing electric transformers and a new apparatus has been designed and constructed to measure time in the testing of watthour meters by an apparatus quicker than the chronograph and more reliable than the stop watch.

The measurement of light involves practically every branch of the new profession of illuminating engineering. The range of problems connected with standards of color, distribution, reflecting power, intensity, efficiency, etc., are practically all problems of measurement for the effective solution of which access to standards are necessary and elaborate equipment needed. New methods of measurement are developed to govern each new type of lamp. The solution of such problems is of vital concern in view of the close connection of proper lighting with human well-being.

The measurement and control of high temperatures is receiving rapidly increasing attention in many industrial lines, and as in other lines the Bureau laboratories are visited almost daily by technical men interested in such problems. A study of the radiation from surfaces of steel at high temperatures is being made. This work is necessary in order to enable observers using radiation pyrometers to obtain true temperatures, a matter of the utmost importance to efficiency in the metallurgical industries. Two problems of importance were studied and the results published, one relating to radiation from a standard of radiation technically known as a "black body" and the other upon the steam expansion line in steam turbines.

The solution of the problem of stem corrections of mercurial thermometers was completed during the year and the published results form an important contribution to the literature of precision measurement in this field. A theoretical and experimental investigation of the effects of thermometric lag on temperature measurements was also completed. These researches facilitate the standardization of thermometers with high precision.

The Seventh Annual Conference on the Weights and Measures of the United States was held at the Bureau in February, 1912, for the consideration of the technical problems in connection with the administration of weights and measures inspection service. Twenty-five States and 51 cities were represented, and the conference was the most successful thus far held. Through this conference the Bureau is leading the movement for correct weights and measures in daily trade, a movement which has now become nation wide.

The Bureau's investigation of the 100 per cent point of the saccharimeter has brought to light an important error in the previously accepted value of this fundamental constant. The application of polarimetry to the standardization of sugar analysis by physical methods has been continued. The Bureau has controlled the accuracy of the sugar analyses at the various ports by check analyses of sugar samples received daily. The type of saccharimeter as developed at the Bureau is now in use at the various customhouses, as are the methods prescribed for such work.

To measure radiant energy, whether light or heat, a precise knowledge is needed of certain constants or data with which to compute temperatures beyond ordinary ranges and for other purposes. The Bureau has for some years been engaged upon the determination of the constants of radiation, a work requiring elaborate experiments, study, and computation. Such work underlies scientific advance in several important fields, such as pyrometry, photometry, and spectroscopy. A new quartz mercury vapor lamp has been prepared as an intense light source for use in radiometry.

Among other researches now under way are a study of the causes and effects of electrolysis on underground gas and water pipes, reenforced concrete, etc., and the use of combustion apparatus in the analysis of cellulose and its derivatives.

DETERMINATION OF PHYSICAL CONSTANTS.

The physical constants upon which practically all technical work in the industries and in engineering is based are among the most important subjects of investigation which the Bureau undertakes. The utility of such work can hardly be overestimated. This is evidenced by the increasing demand for such data from all branches of industry. The efficiency of materials and of industrial processes depend upon such data. To do this work with sufficient precision requires access to various kinds of standards and the most perfect available equipment. During the year the Bureau has conducted researches in the several branches of its work, among which may be mentioned the following:

A summary of our present knowledge of the melting points of the chemical elements was prepared and published during the year. The Bureau is now prepared to determine the expansivity of brass and other metals from room temperature up to about 700° C. Many determinations of refractive indices, including very precise determination on standard test liquids and glasses, and of the direct reading refractometers, have been made. An absolute color analyzer giving color analyses directly in terms of the wave length of the dominant hue and the per cent white impurity was devised at the Bureau and

put in daily operation. The work may be supplemented by a more careful study of trichromatic analysis. The Bureau has completed a series of measurements of the characteristics of radiation from platinum, neon, helium, and the acetylene flame, in which it is found that the metals have no radiation constants, and also that the maximum radiation of neon is in the visible red.

The scope of measurement of optical instruments as to their aberrations, focal length, aperature, field covered, magnification, reading light, loss, definition, etc., was carefully outlined in a new circular issued by the Bureau early in the year. A large number of optical instruments and accessories have been tested during the year along these lines. The development of such tests is to provide standard tests for all the elements which affect the efficiency of an instrument. It is therefore essential that the test be based upon correct scientific theory in each case, thus involving research and new apparatus.

The determination of the length of the light waves from the element neon has been completed and published. The values obtained are accurate to at least 1 part in 5,000.000—a value heretofore unequaled. The surprising accuracy of which the use of light waves as length measures is susceptible makes this work the most promising development toward highest precision in length measurement. One application now being made of this method of measurement is to determine the expansion of various materials under changes of temperature. The precise determination of expansion is of great importance in many fields of industrial and technical work.

An accurate determination of the density and thermal expansion of pure ethyl alcohol has been completed. This work has been done with the utmost thoroughness both as to the preparation of pure alcohol and the determination of its physical constants, and the results are ready for publication. Cooperative work is also being done upon the exact determination of other physical constants of pure alcohol, data needed by the industries and the Customs Service in the collection of revenues.

The determination of the atomic weight of bromine was completed during the year and the results will soon be published. Twelve special investigations upon standard methods of chemical analysis on tests were published or prepared for publication during the year.

DETERMINATION OF PROPERTIES OF MATERIALS.

As rapidly as possible the Bureau is developing the standard methods of testing the quality of materials. In many cases standard tests are lacking; in others the existing methods are defective. In each case investigations are undertaken to place the determination of properties of such materials upon a thoroughly scientific basis. The

development of specifications is part of the general work upon materials, and the Bureau has been fortunate in securing thus far the hearty cooperation of the other departments of the Government, as well as typical manufacturers and users. The testing of materials is done for practically every department of the Government, and in special cases for manufacturers. In cases of dispute the Bureau acts as referee.

Many tests of ceramic materials for Government departments have been made. Among the researches in progress are the study of the influence of time upon the rate of vitrification of clays, viscosity of porcelains, the behavior of clay refractories, the crushing strength of burnt clay as affected by porosity, the production of high-temperature porcelain, the dehydration of clays, the effects of overfiring, and a study of paving brick as to wear in actual service.

The standardization of the quality of lime has been recently undertaken. The Bureau has devised tests to cover chemical analysis, plasticity, carrying capacity, color, waste, hardness, crushing strength, tensile strength, and shrinkage, and these tests are available to the general public for a nominal fee. Researches are in progress in order to place all tests upon a scientific basis without sacrificing their practicability. The Bureau is at present cooperating with the proper trade and technical societies in the development of standard specifications for lime.

During the year 8,613 tests of materials were made, comprising irons and steels, metals and alloys, coated metals, cements, asphalt and coal tars, asphalt, felts, linseed oil, oil driers, paints and paint materials, varnishes, lubricating oils, sealing wax, rubber, papers, printing inks, wool, flax packing, asbestos, insulating tape, and more than 200 miscellaneous tests. The work was done for practically every department of the Government.

The year marked the installation of the 10,000,000-pound Olsen testing machine at the Pittsburgh branch of the Bureau, and the installation of the major part of the large Emery testing machine at Washington. The latter is for both compression and tension and has a capacity of 2,300,000 pounds.

During the year the Bureau tested 19,365 samples of cement, representing purchases by the Government amounting to 2,000,000 barrels. The determinations on each sample included specific gravity, fineness of grinding, time of setting, soundness in air, water, and steam, and tensile strength. By such tests the Government is assured of the quality of the material which enters so largely into the construction of the Isthmian Canal and of Federal buildings throughout the country, and in the other construction work of the Government. Improved methods are being developed for each kind of test.

The Bureau maintains cement-testing laboratories at Pittsburgh and Northampton, Pa., where the sampling and testing are done for the principal points of shipment of cement.

The magnetic properties of many steels have been studied to aid manufacturers of electrical machinery to find the most suitable steel for various purposes. Such measurements result in the economic use of material, avoid waste of energy due to inefficient material, and thus secure higher efficiencies in electrical machinery and apparatus. The measurement of magnetic permeability under conditions found in telephony are of importance, and new methods have been devised.

The work in metallurgy and metallography included the determination of the heating and cooling curves of samples of steel and a number of metallographic tests. The changes in the rate of cooling are characteristic of the properties of the material and a careful study is being made of the factors affecting recalescent points in pure iron and in iron alloys and on the methods of finding heating and cooling curves. The correlation of temperature measurements with the properties of metals is a field of great economic possibilities, which will be of application to the whole range of metallurgical industries. Many heat determinations were made upon materials, such as freezing and absorption tests of brick, and the flashpoint and viscosity of 85 samples of lubricating oils. The melting points of 53 metals, alloys, slags, etc., and of 54 samples of fire clay, bauxite, silica, magnesia, and chromite bricks, were determined. Such work at extremely high temperatures is possible only in the vacuum furnace of special construction. Work is progressing on the melting points of such high refractories as magnesia and lime, which indicate much higher melting points than heretofore supposed.

Among the pure materials used in testing instruments, superrefined sugar of a purity needed in testing saccharimeters and calorimeters has been prepared by the Bureau as heretofore and the certainty of analysis has been enhanced during the year.

The absorption of glasses intended to protect the eye from injurious ultra-violet radiation and yet absorb a minimum of visible light have been investigated. As a result of the Bureau's cooperation, American-made glasses are now available which are far more efficient than any of the best imported glasses.

A large volume of information has been gained concerning the effects of light and moisture upon electric insulators. The data are now being prepared for publication.

A striking instance of the far-reaching results of the study of the properties of materials is afforded in the pending investigation of magnetic and mechanical properties of steels, which seem so closely correlated. The magnetic tests show, as found in the Bureau's investigation, whether the steel in springs or tools has received cor-

rect heat treatment to give the desired mechanical properties. Similar tests also indicate whether the material has been locally overstrained. Defective rails were found to have low magnetic permeability. In fact the effect of every defect made by bending, nicking, stretching, boring, or otherwise is distinctly portrayed in the alteration of the magnetic properties which thus become an index of the mechanical changes. These researches at the Bureau give rise to a hope for commercial application, extending possibly to the testing of rails for soundness and safety.

The effects of electric currents upon underground metal construction has been for the past two years the subject of elaborate investigation both in the field and in the laboratory. The loss due to the disastrous effects of stray currents in the ground has called for the most careful scientific study. In addition to the elaborate measurements of the effects of electrolysis under various conditions an electrical survey was made in a number of cities. The conditions under which trouble might be expected were ascertained and methods are being developed to minimize the damage from this source. In the laboratory the conditions were under perfect control and covered a selected range of tests. In the cities actual service conditions were studied. The results of this investigation are being prepared for publication and the work will be carried to completion during the coming year.

An investigation of waterproofing materials is now in progress. Various commercial products have been subjected to analysis and study. A series of exposure tests of white paints is being made, for which 125 paints were prepared from 13 primary pigments by systematic combination and exposed to the weather. Tests of 20 paints for metals have also been made by intermittent immersion in fresh water. These results will appear in an early report.

Through the efforts of the Bureau a single standard specification for Portland cement has been adopted and by presidential order made effective April 30, 1912, for all Government purchases. The Bureau has now secured the cooperation of the national technical societies for the adoption of a single specification for the entire country. The serious effects of sea water and alkali water upon concrete led to the study of the subject, the results of which study will shortly be published. The permeability to water of structural materials is being investigated. This is an important subject to the general public and the Government in the design of structures which require dampproofing. The changes of volume of cement which result in cracking are being studied both in the laboratory and in the field. In connection with the remarkable effects of steam curing upon concrete, the Bureau is investigating the use of high-pressure steam as an indication of the structural quality of cement. Other investigations give promise of

important results in the direction of improved efficiency and economy in the use of structural materials. In this connection, the Bureau has erected at Pittsburgh an experimental plant to study the effect of varying composition upon the physical properties of cement.

Special testing machines and improved methods were developed for the physical testing of miscellaneous materials, such as mechanical rubber goods, metal, leather, packings, etc. About 1,000 physical tests of such materials were made. A study of the life and efficiency of elastic rubber bands is being made and an accelerated test developed. A study of the properties of leather belting and methods of testing is in progress, with a view to improving specifications. The aging properties of various rubber compounds are being specially investigated. The Bureau conducted an exhibition of its rubber-testing equipment at the International Rubber Exposition in New York City, the exhibit awakening a keen interest among the rubber experts from all parts of the world who visited the exposition. More than 500 textile tests were undertaken to determine the physical properties of textiles. The Bureau has made during the year numerous tests of raw wool to determine the grease and moisture present and the regain. The standardization of specifications for fabrics, yarns, and twines is being undertaken at the request of various Government departments. More than 2,500 samples of asbestos have been tested for physical properties. As heretofore the Bureau has tested the papers, cloths, and other materials used in printing and binding and has done much work for the General Supply Committee and the various Government departments.

The determination of the properties of materials by measurements has for its primary object the development of standards of quality of materials. These are embodied in standard specifications which are developed with the cooperation of all interests concerned. The value of such standardization to the maker, the dealer, and the consumer is beyond estimate.

The Bureau is largely indebted for the success of its work thus far to the hearty cooperation of the national technical societies, the manufacturers, and the technical representatives of the Government bureaus.

BUREAU OF FISHERIES.

FISH-CULTURAL WORK.

Despite many difficulties, the Bureau's activities in 1912 in the propagation, rescue, and distribution of the more important food fishes were attended with gratifying results. It is especially noteworthy that the total output exceeded that of the record year of 1911, though the egg collections of whitefish and pike perch, two of the most

important fishes handled, were less than one-third the quantity taken in 1911.

The total number of fry planted was over 3,426,000,000, and of fingerlings, yearlings, and adults over 32,200,000. More than 229,599,000 eggs were distributed, nearly all to State fish hatcheries.

The work was conducted in 31 States and the Territory of Alaska, and consisted of the propagation of 42 species at 32 main and 92 auxiliary stations, including the new salmon auxiliaries on the Duckabush and Quilcene Rivers, in the Puget Sound region, Washington, which were completed and put in operation during the year. Special efforts were directed to the cultivation of the salmons of the Pacific coast, the commercial fishes of the Great Lakes region, and the anadromous and marine species of the Atlantic seaboard, though the fishes of the interior, comprising the various species of trouts, the basses, crappies, and sunfishes, were also propagated extensively.

The success of the fish-cultural work hinges largely on the physical and meteorological conditions prevailing in the short spawning seasons of the various species of fishes. High winds, freshets, droughts, and abnormal heat or cold all render abortive the most elaborate preparations, and cause variations from year to year in the output of the stations so affected. Owing to extremely low water stages during 1911, quantities of salmon were unable to reach the streams covered by the Bureau's work in California; violent storms on the Great Lakes in the fall curtailed the collection of whitefish eggs, and abnormally cold weather and floating ice in the spring of 1912 made it impossible for the fishermen to operate their nets, resulting in a heavy decrease in the take of pike-perch eggs. However, while the output of fish from these particular fields compares unfavorably with that of last year, increases in the collections of other important species, together with the superior quality of most of the eggs obtained, enabled the Bureau to exceed the output of 1911 by 41,626,522 fish and eggs.

One of the successful features of the work was the rearing to fingerling size of 1,500,000 young salmon at the Clackamas and auxiliary stations, where three months' supply of food for the growing fish was donated by the Columbia River packers, who wished to demonstrate that the fisheries could be more adequately aided thus than by planting the entire hatchery output in the fry stage.

At one of the Columbia River stations the experiment of purchasing brood chinook salmon from trap-net fishermen and holding them in pens to ripen resulted in largely increased egg collections, at reduced expense, and it is believed this plan may be advantageously and economically adopted at other points on this river.

At Yes Bay, Alaska, the hatchery was filled with blueback-salmon eggs of superior quality, and sufficient fish to have produced at least

20,000,000 more were left in the river owing to lack of hatching facilities. The capacity of this hatchery will be enlarged another year from 72,000,000 to approximately 87,000,000 eggs by increasing the number of eggs to a basket and by the construction of 160 new hatching troughs, which will permit the rearing of from 35,000,000 to 40,000,000 fry to the feeding stage. In view of the apparent increase in the salmon runs in southeast Alaska, the possibility of securing eggs in larger numbers, and the desirability of rearing a larger percentage of the fry to the fingerling stage, another hatchery of greater capacity than the present one might advantageously be provided.

The collections of eggs of the blueback salmon at the Afognak station were about equal to those of the previous year. The output, though somewhat smaller in number, represents in reality a greater degree of success, inasmuch as 10,500,000 young fish were reared to the fingerling stage before liberating, whereas no work of this character was accomplished in 1911. It is believed that the usefulness of the Afognak station would be greatly extended by establishing egg-collecting fields on other streams on Afognak and adjacent islands, and it is proposed to establish two such auxiliaries on Kodiak Island, at Eagle Harbor and Eganak Lake, within the next year.

The usual Pacific coast shad operations were conducted near the falls of the Willamette River, and resulted in the liberation of 2,500,000 fry. In the Columbia River shad are said to be increasing to such an extent that the packers are planning increased facilities for placing them on the market.

While there was no apparent increase over recent years in the run of shad in the Potomac River, a record was established in the take of shad eggs at the Bryan Point station, the collections amounting to 88,727,000, and the yield of fry to 81,000,000, or 92 per cent of the eggs obtained. The nearest approach to this record occurred in 1903, the egg collections of that year numbering 86,370,000 and the output of fry amounting to 69,772,000. The high degree of success is attributed to the uniformly favorable weather and water temperatures during the spawning season, which permitted the capture of a larger per cent of fish with uninjured eggs, and also to improved methods of handling. Though the take of eggs of yellow perch at this station was somewhat curtailed by cold weather at the beginning of the season, the output of fry amounted to over 192,000,000.

The output of shad from the stations on Albemarle Sound and the Susquehanna River was substantially larger than that of last year, but here also the improvement was due more to favorable weather conditions than to an increase in the run of shad.

The year's operations with the marine fishes at the Boothbay Harbor station were highly successful. There was a slight deficiency in the cod work, owing to the nonappearance of the second run of fish

along the Maine coast, and the haddock work was interfered with by stormy weather, but these shortages were more than offset by the results attained in the hatching and distribution of lobsters and flatfish.

The collections of cod and flatfish for the Woods Hole station were far above the average, taxing the hatching facilities to the utmost, notwithstanding the installation of additional equipment. At the Gloucester station, also, the available hatching apparatus proved entirely inadequate for the large numbers of pollock, haddock, and flatfish eggs secured, and the losses during incubation were much larger than would have been the case under normal conditions.

At the inland stations, where the basses and other warm-water fishes are propagated, the work was encouraging. Notwithstanding the healthy growth and expansion of this feature of the Bureau's work, however, it is unable at the present time to cope with the enormous demands from all sections of the country for such fish as the basses, crappies, sunfishes, and catfishes for the stocking of private and semiprivate waters adapted to pond culture. In view of the rapidly increasing demand for these species, it seems highly desirable that new pond stations be established and that the facilities of those already in operation be increased. Until very recently the output of pond fishes has depended to a large extent upon collections made from the overflows of streams in the Mississippi Basin. When the water stages are favorable this source furnishes an abundant supply, but occasionally there are long periods of drought in the rivers, which condition necessitates the abandonment of the work and makes this supply very uncertain.

The results attending the propagation of black-spotted trout in the Yellowstone National Park, which is the source of supply for the Montana, Colorado, and South Dakota stations, justify the prosecution of the work on a more extensive scale in future. During the summer of 1911 nearly 20,000,000 eggs were collected and batched with only normal losses. This excellent work was accomplished with fish-cultural facilities of the most primitive character, and without sufficient shelter for the employees engaged in the operations. The impossibility of handling the large numbers of eggs with the field apparatus available necessitated the hurried construction of additional hatching troughs, which were located in the beds of streams and at other points where a water supply by gravity could be secured.

The Bureau invites the cooperation of the various State fish commissions in its work, fully realizing the value of their assistance in the propagation and distribution of fish in fields that it has difficulty in covering with its available facilities. It realizes, indeed, that in many cases success or failure depends upon the attitude assumed by the State officials. During 1912 over 209,000,000 fish and eggs

were donated to the hatcheries of 24 different States. In some of the States, however, there is a growing tendency to hamper the Bureau by the imposition of restrictions, and in other States inadequate fishery laws or the lax enforcement of existing laws operates against the success of the Bureau's efforts.

INVESTIGATIONS AND SURVEYS.

Owing to the necessity for repairs to the steamer *Fish Hawk*, which is the only vessel available for the purpose, the Bureau has been unable to continue the oyster surveys which for a number of years have been a much appreciated and economically valuable feature of its operations. At the end of the fiscal year, however, at the urgent request of the State authorities, plans were being made for a survey in the waters of Texas.

Considerable progress was made in the study of the habits and life history of the drill and other natural enemies of the oyster which annually cause great loss to the oyster growers of the Atlantic and Gulf coasts. A verbal report on the progress of this work and the results attained, made to a recent national convention of oyster growers, was received with favorable attention.

Experiments in diamondback-terrapin culture, which have been in progress for several years, have been continued and the results attained lead to the expectation that breeding and raising this valuable terrapin in captivity will soon become a profitable industry.

Investigations were made of the pearl-mussel resources of the Cumberland, Illinois, and Arkansas Rivers, and reports of interest to the mussel fishermen and the pearl-button manufacturers will be issued at an early date. A preliminary report giving prompt information of the conditions on the Cumberland River was favorably received by those economically interested. At the end of the fiscal year an investigation of the mussel supply in the lakes of northern Minnesota, a practically virgin field, was under way.

The laboratory and mussel hatchery at Fairport, Iowa, is still in course of construction, but notwithstanding that fact and the adverse conditions obtaining in the rivers, 3,688,000 larval mussels were liberated from this source, and 492,000 at the auxiliary station at Homer, Minn. The total is about 3½ times the number liberated in the preceding year. Scientific investigations designed to develop fully the economic value of the station were conducted by the permanent personnel and temporary assistants.

The study of fish diseases, than which there is no subject more urgently demanding inquiry, has been practically abandoned for lack of personnel. The Bureau has repeatedly recommended provision for this work, but at the end of the fiscal year there was no

indication that Congress would create the position of fish pathologist required for the control of disease in the Bureau's hatcheries.

Biological and physical investigations of the conditions controlling fish life and limiting fish culture and the introduction of fishes were conducted in Maine, New Hampshire, New York, Illinois, Wisconsin, Minnesota, Washington, Idaho, California, and Nevada. In some cases this work was carried on in cooperation with the several States, and in other instances by the utilization of the services of experts from colleges and universities.

Studies were made of the physiology of the Pacific salmons, especially in respect to the storage of fats, the quantity of which in the tissues of the fish largely fixes the value for cannery purposes. Further investigations were made concerning the life histories and migrations of these fish—data necessary as a basis for rational regulation of the fisheries and for the direction of fish-cultural operations.

The biological stations at Woods Hole, Mass., and Beaufort, N. C., were operated during the usual season, a number of temporary investigators and assistants being employed at each. In addition to the more practical work in relation to the fisheries and fishery products carried on by the paid investigators, a number of scientific men were accorded the privileges of the laboratories for the conduct of more abstract research.

An investigation was commenced which will eventually include all of the valuable marine animals of the Chesapeake basin for the purpose of determining the means by which the great aquatic resources of that important region can be utilized to the highest degree commensurate with their permanent maintenance. Owing to the large population adjacent to Chesapeake Bay and the number who resort to its waters for a livelihood, it is vital to both the consumer and the fisherman that its resources be administered with care.

The preliminary investigation of the fishing grounds of Alaska for the purpose of discovering new halibut banks, which was begun in May, 1911, extended to September of that year, and a report on the results obtained has been prepared and issued. The steamer *Albatross*, equipped with practical fishermen and fishing apparatus, was detailed for the work, which extended from southeast Alaska to Bering Sea. While no large catches of halibut were made in any one locality, many of the trials led to the belief that commercial fishing in the vicinity would be profitable. The results accomplished, however, are chiefly valuable as indicating the lines along which further investigations may be conducted; and it is the intention to continue this work and make it as comprehensive and economically useful as possible.

An assistant of the Bureau was again detailed to cooperate with the Smithsonian Institution and other scientific bureaus of the Government in a biological survey of the Canal Zone.

COMMERCIAL FISHERIES.

Oyster industry of Atlantic and Gulf coasts.—The taking of oysters from natural and cultivated grounds is the most important branch of the fishing industry in nearly every State from Connecticut to Texas. This business has for several years been the subject of the most detailed statistical canvass ever made, and the results so far obtained have been published in a number of special bulletins, leaving only a part of the Middle Atlantic region still to be covered. Special attention has been given to the development attained by oyster culture, on which the future success of the industry depends; and the statistics possess particular interest and value because of the comparisons that are made possible.

In the New England States the number of persons engaged in the oyster industry in 1910 was 4,932, wages paid $1,378,191, investment $2,164,007, oyster grounds owned or leased for planting purposes 124,738 acres, of which 45,514 acres were under culture, and the output of oysters from private and public areas aggregated 5,942,021 bushels, valued at $3,597,034. In the South Atlantic States in the same year the number of persons engaged in the industry was 4,241, wages paid $436,541, investment $563,863, oyster grounds owned or leased 6,787 acres, and the yield of oysters was 1,700,998 bushels, valued at $364,184. In the Gulf States in 1911 the number of persons engaged in all branches of the industry was 8,541, wages paid $1,682,536, investment $2,442,826, oyster gounds owned or leased 36,699 acres, and the output of oysters was 6,226,141 bushels, valued at $1,476,966. Statistics are not yet available for all of the Middle Atlantic States, but in New York in 1911 the number of persons engaged in the oyster industry was 2,979, wages paid $1,610,215, investment $2,204,979, oyster grounds owned or leased 87,256 acres, of which 33,155 acres were under culture, and the yield of oysters from private and public areas aggregated 3,917,819 bushels, valued at $3,381,623. In New Jersey, Delaware, and Pennsylvania the number of persons engaged in the industry was 4,990, wages paid $671,611, investment $1,718,317, oyster grounds owned or leased 41,878 acres, of which 30,451 acres were under culture, and the output of oysters was 3,271,738 bushels, valued at $1,467,254.

New England vessel fisheries.—The high-sea vessel fisheries centering at Boston and Gloucester, in Massachusetts, are the most important of the kind in the country, and have long been the subject of special inquiry on the part of the Bureau. Detailed statistics showing the extent and condition of each branch of the fisheries have been

gathered by local agents and published for the information of the trade as monthly and yearly bulletins. The statistical data issued have covered the quantity and value of each species of fish taken on each ground by the vessels discharging their fares at each of the two ports named.

The number of fares of fish landed at Boston in the calendar year 1911 was 3,971, aggregating 93,628,909 pounds of fresh fish, valued at $2,565,527, and 131,200 pounds of salted fish, valued at $9,755; a total of 93,760,109 pounds, valued at $2,575,282. The number of fares landed at Gloucester was 2,829, aggregating 51,235,681 pounds of fresh fish, valued at $1,083,862, and 40,157,577 pounds of salted fish, valued at $1,365,353, a total of 91,393,258 pounds, valued at $2,449,215. The total for the two ports was 6,800 trips, aggregating 185,153,367 pounds of fresh and salted fish, having a value of $5,024,497. Compared with the previous year there was an increase of 241 trips, and 3,419,095 pounds in the quantity and $191,156 in the value of fish landed. The greater part of this output, or 109,926,119 pounds, valued at $2,803,319, was from fishing grounds lying off the coast of the United States; while 30,943,353 pounds, valued at $877,462, were from grounds off the coast of Newfoundland, Greenland, and Labrador, and 44,233,896 pounds, valued at $1,343,716, were from fishing banks off the coast of the Canadian Provinces. Newfoundland herring constituted 11.92 per cent of the quantity and 9.21 per cent of the value of the products of these fisheries.

The quantity of mackerel landed at Boston in 1911 was 2,588,694 pounds fresh, valued at $142,114, and 131,200 pounds salted, valued at $9,755, and at Gloucester 510,140 pounds fresh, valued at $30,132, and 1,307,900 pounds salted, valued at $101,886. The mackerel fishery as a whole yielded much better returns in 1911 than in the previous year, the total catch being about 7,837,380 pounds fresh and 1,326,600 pounds salted, against about 3,591,000 pounds fresh and 679,000 pounds salted in 1910. The total catch of mackerel during the season of 1912, up to the first of July, was the smallest on record to that date, being only about 1,931,940 pounds fresh, valued at $160,995, and 403,000 pounds salted, valued at $22,165.

During the season of 1911–12 there were 55 American vessels engaged in the herring fishery off the west coast of Newfoundland, nearly all of which obtained full cargoes. Second trips were made by 19 vessels, and 1 vessel made three trips. Three of the fleet had a mixed cargo of herring and cod. In addition to the American fleet 2 Newfoundland vessels were engaged in the fishery, both of which landed their fares at Halifax, Nova Scotia. No Canadian vessels were on the ground, but frequent shipments of barreled and fresh frozen herring were made from Bonne Bay and Bay of Islands to Halifax by an agent who was stationed at Birchy Cove.

The American catch of herring for the season of 1911–12 in Newfoundland waters amounted to 68,666 barrels of salted and 23,117 barrels of frozen herring, representing 21,161,333 pounds, having a value of $457,816.

Up to July 1, 1912, a greater number of vessels fished for cod on the Grand Banks than for several years past, and obtained fairly good catches, amounting to more than during the previous year. On all the banks, at different periods, there was a scarcity of bait which caused a considerable delay to the fleet. Taking the season as a whole, however, in comparison with other years, the supply of bait has been quite satisfactory. The quantity of cod landed at Boston and Gloucester in 1911 was 33,977,143 pounds fresh, valued at $994,488, and 19,729,034 pounds salted, valued at $886,490.

Haddock continues to be an important factor in the markets of Boston and Gloucester. The total amount of fresh haddock landed at Boston and Gloucester the past year up to July 1 was 60,533,968 pounds, having a value of $1,255,468, an increase of 9,956,968 pounds in quantity over that of the preceding year, but of only $79 in value. In addition to the catch of fresh haddock there were 461,679 pounds of salted haddock landed, valued at $7,931, an increase of 24,836 pounds in quantity, but a decrease of $14,000 in value.

The Atlantic halibut fishery, although small as compared with that of the Pacific coast, continues to supply the market with the usual quantity of fresh and salted product. Each year the same general area of fishing ground is covered, extending from Georges Bank to Greenland, Davis Strait, and sometimes Iceland. A large portion of the fresh halibut caught is sold in Boston, but the salted halibut is mostly disposed of in Gloucester. The catch landed at these two ports in 1911 amounted to 3,090,778 pounds fresh, valued at $264,578, and 410,967 pounds salted, valued at $35,171.

The introduction of the beam or otter trawl has caused considerable alarm among most New England fishermen, who realize that it is an important factor and may possibly supplant the common trawl line. In 1911 there were four vessels fitted with beam trawls sailing out of Boston. The approximate catch of these vessels was 7,000,000 pounds of fish, mostly haddock. In the early part of 1912 two other steamers were put in commission, and later in the season another vessel was added to the fleet. The catch of this fleet, from January to June, inclusive, was over 8,500,000 pounds, the greater part of which was haddock. Other species, such as cod, halibut, flounders, and pollock, were also taken in considerable quantities.

Pacific coast fisheries.—The Pacific coast cod fishery is now represented by 9 firms employing 20 vessels, 13 of which sail out of San Francisco and 7 out of ports on Puget Sound. The catch of cod in

1911 was reported to be 2,793,000 fish in number, or 10,772,000 pounds, the average weight of cod being reckoned at 4 pounds. The catch exceeds that of the preceding year by 824,000 fish, or 3,296,000 pounds. The estimated value of the season's catch is $325,000.

The fishing grounds for cod are in Bering Sea and along the coast of central Alaska from the Shumagin Islands to Unimak Pass. Cod are, however, more or less plentiful on the offshore banks from Portlock Bank westward; but it has not been necessary to resort to these grounds, the banks above mentioned having supplied the demand.

There was a slight increase in the catch of halibut on the Pacific coast in 1911 over that of the previous year, 35,047,900 pounds being landed at Puget Sound ports.

The banks of southeast Alaska were extensively fished by steamers. A considerable number of sail and power schooners which heretofore had fished in that region confined their operations chiefly to Flattery Bank, where large catches were made which found a market at Seattle.

The size of the halibut fleet is steadily increasing, new and larger steamers being added each year. In the spring of 1912 two modern-type vessels from Gloucester joined the halibut fleet of the Pacific. It is reported that other eastern vessels are to follow. A much larger area is now fished than formerly, and greater efforts are put forth to supply the growing demand for halibut. With the discovery of new banks it is reasonable to suppose that the fishery is destined to expand to even greater proportions.

For many years after the introduction of shad on the Pacific coast very little use was made of the fish, even after they had become sufficiently abundant to supply a large demand. In the last few years, however, the demand for fresh shad has increased greatly, and considerable quantities of shad and shad roe are being canned in a manner similar to the use of salmon.

In the last few years seining for salmon in and off the Strait of Fuca and on Flattery Bank has developed into a fishery of considerable importance, the fleet now consisting of 150 boats, employing nearly 900 men. This fleet intercepts the schools of salmon on the banks before the run strikes in to shore to enter the rivers, and thereby affects the catch of traps and gill nets in the sound and rivers.

ALASKA FISHERIES AND FUR RESOURCES.

As the returns from Alaska are not available until the late fall of each year, the information in this report pertains to the calendar year 1911, and not to the fiscal year which ended June 30, 1912.

Alaska Salmon Service.—There has been the usual annual inspection of the fisheries and private fish-cultural operations for the pur-

pose of enforcing the Alaska salmon laws and regulations; and, in addition, the agents have collected statistics and made inquiries regarding all the fishing industries in the Territory.

It was found that the measures adopted by the Government for the protection of the salmon and the conservation of the supply have, with rare exceptions, been well observed throughout the vast region.

The run of salmon was exceptionally good in southeastern Alaska, fair in central Alaska, and poor in western Alaska. The total catch was 43,975,873 fish of all species, resulting in a pack of 2,823,817 cases, valued at $14,593,237. The number of canneries in operation was increased from 52 to 64, the greater number of which were located in the southeastern district. The number of persons employed was 14,786. There was a falling off of nearly 2,000,000 in the catch of the high-grade sockeye or red salmon and an unprecedented increase in the take of the less valuable species. The net increase over 1910 was 10,296,619 salmon, and the pack, consisting more largely than ever before of the cheaper grades, was the largest in the history of Alaska.

The marked success of a floating cannery operated in southeastern Alaska resulted in the equipment of other such plants in preparation for the 1912 season.

Under existing legislation fishing interests owning private salmon hatcheries are relieved from all license fees and taxation at the rate of 10 cases of canned salmon for every 1,000 red or king salmon fry liberated. The rebate in 1911 amounted to $42,647, on 106,617,500 fry. This law has been subject to criticism and complaint, and a provision for a new system of taxation was embodied in a bill which was introduced in the Senate March 15, 1912. A number of hearings before the subcommittee of the Senate Committee on Fisheries had been held before the end of the fiscal year, but no further action upon the bill was taken.

Other Alaska fisheries.—Incidental to the work of salmon inspection, general statistics of the fishing industry of Alaska have been collected as heretofore. Next to the salmons, the species supporting the most valuable fisheries are halibut, cod, and herring.

In the halibut fishery 651 persons found employment, and the capital invested was $1,194,073. The output of this fishery amounted to 17,315,171 pounds, or 4,264,118 pounds less than in the previous year. Owing to the higher prices prevailing, however, the catch was valued at $822,362, or an increase of $13,352 over the 1910 figures.

The cod fishery employed 284 persons, and the capital invested was reported as amounting to $215,670. The catch was 3,597,288 pounds, valued at $108,790, an increase over last year of $45,347.

Of the other products the herring is the most important, and indications are that it will be exploited vigorously henceforth. The

capital invested in the fishery was $295,220, and 265 persons were employed. The value of the yield was $201,909, an increase of $86,144 over the previous year.

An appreciation of fishery products hitherto regarded as waste is becoming evident, and small experimental plants designed to make use of such materials were equipped in southeastern Alaska in readiness for operation during 1912.

The total quantity of fish of all kinds taken in the Territory was 256,154,109 pounds; of prepared products, including aquatic furs and skins, there were 177,572,873 pounds, valued at $16,863,728, an increase of $3,603,869 over 1910. The total investment, including cash capital, was $22,671,387.

Fur-seal service.—Sealing operations on the Pribilof Islands during the season of 1911 were conducted, as during the preceding year, under the immediate direction of the fur-seal agents of the Bureau of Fisheries. The instructions to the agents limited the killing, as usual, to male seals with skins weighing not less than 5 pounds nor more than 8½ pounds. These weight limits restrict the killing practically to the 3-year-old and the larger 2-year-old males. No killing is permitted until there has been a reservation of 1,000 of the finest 3-year-old males for breeding purposes. No definite quota or number of seals to be killed was specified in the instructions, the policy being to take only such surplus males of proper size as may be found after making the necessary breeding reserve.

The skins taken during the year, 12,002 in number, were shipped to London, England, and there sold for the Government by Messrs. C. M. Lampson & Co. on December 15, 1911. The net proceeds of this sale (transportation expenses, marine insurance, and sales commission deducted) were £79.297 12s. 8d., or $385,862.28. Under the leasing system the Government would have received only $122,720.

The fur seals of Alaska, as well as those of Siberia and Japan, are now greatly reduced in numbers as a result of the killing of mother seals in the sea and the consequent starvation of their young on land. A similar depletion of the Alaskan herd occurred about a century ago under Russian control, the cause being the killing of female seals on land. In 1834 the Russians stopped the killing of females, and the herd recuperated rapidly. Under the existing international agreement, which prohibits the destruction of female seals at sea (they have never been killed on land since the United States acquired possession of Alaska), it is confidently believed that the herd will rapidly increase in numbers.

The convention recently concluded forbids the native Indians of Alaska to take seals by means of firearms, as they had been accustomed to do for many years during the annual northward migration of the herd toward the Pribilof Islands. The natives having lost the

art of hunting seals by the primitive methods, there will probably be no skins taken by them henceforth.

Minor fur-bearing animals of Alaska.—The blue foxes taken on the Pribilof Islands during the winter of 1910–11 were the first secured under the direct management of the Government agents. The skins taken, 391 in number, were shipped to London with the sealskins for the year 1911, and were sold at auction for the Government by Messrs. Lampson & Co. on March 18 and 19, 1912. The net proceeds of this sale (transportation expenses, marine insurance, and sales commission deducted) were £3,096 2s., or $15,096.58. Special efforts, in continuation of work previously begun, were directed toward the improvement of the methods of handling the fox herds and the improvement of the stock. Experiments that have been made in feeding, selective breeding, and general management give reason to believe that not only can the output be greatly increased but that the quality of the fur can be improved.

The act to protect the seal fisheries of Alaska, and for other purposes, approved April 21, 1910, made it the duty of the Secretary of Commerce and Labor, in addition to directing the management of the fur-seal herd, to establish regulations for the protection of all other fur-bearing animals of Alaska and to secure the enforcement of the laws and regulations relating to them. Congress having made provision for one fur warden and four deputy fur wardens, these officers were duly appointed, and have been in Alaska continuously since their appointments became effective in the summer of 1911.

The wardens have been assigned to various localities with a view to covering as much of the Territory as possible. They visit the more important fur-producing regions, live with the hunters and trappers, study their methods, advise them as to the requirements and purpose of the law, see that the law is observed, and make investigations and studies of the abundance, distribution, and habits of the different species of fur-bearing animals. They also study the condition of the fur of each species in each month of the year in order to determine for each region when it is prime. The wardens are also endeavoring to create among the buyers of pelts a sentiment against the buying of unprime skins, and a special effort has been made to show the native hunters and trappers that their own welfare in so far as it relates to the fur industry depends upon the enforcement of such regulations as will maintain the supply of fur-bearing animals.

Cooperation between this Department and the governor of Alaska has been arranged whereby a more effective enforcement of both fur and game laws will be secured. Five of the Alaska game wardens have been appointed special fur wardens for this Department, and the five fur wardens of the Department have been appointed special game wardens. The game wardens are paid for such special services

a nominal salary of $10 per month. The special wardens have all the authority in respect to their special service that is possessed by the regular wardens.

It is hoped and believed that the Department will be able to develop and apply a rational system of protection which will result in a few years in building up the fur industry of Alaska to far beyond its present proportions.

Up to the present time the only reports received by the Government on shipments of furs out of Alaska have been of those made by freight (or express) and passing through the customhouses. It was known that large quantities went out by mail and smaller lots in other ways, but no effort had been made to obtain records of such shipments. Recently the Department has been able to make an arrangement with the Post Office Department whereby certified reports are received by the Bureau of Fisheries of all mail shipments of furs. It has been found that these amount in value to many thousand dollars annually.

MISCELLANEOUS ACTIVITIES OF THE BUREAU.

One of the most notable achievements of the year was the successful introduction of reindeer on the Pribilof Islands. Through the courtesy of the Department of the Interior, acting through the Bureau of Education, 40 adult reindeer were furnished to this Department for stocking those islands. Through the cooperation of the Revenue-Cutter Service the reindeer were successfully landed in August, 1911. Twenty-five were placed on St. Paul Island and 15 on St. George, in charge of experienced Eskimo herders. The reindeer moss and other food on the islands proved adequate and the herds passed through the winter in excellent condition. In the spring of 1912, 17 healthy fawns were born on St. Paul Island and 11 on St. George. The last reports received from the islands state that both young and old reindeer are doing well. It is believed that the supply of natural food will prove sufficient to support on each island a considerable herd which will eventually contribute to the comfort and well-being of the inhabitants of the islands by supplying them with food, clothing, and burden carriers.

Steps have been taken to institute at Seattle, Wash., a service similar to that maintained for many years at Boston and Gloucester, Mass., for collecting and diffusing information regarding the extent and condition of the fisheries centering there. Difficulty in securing the services of a duly qualified local agent has delayed the inauguration of the work.

At the request of the Department of Agriculture, numerous samples of fishery products of domestic and foreign origin have been examined in the Bureau of Fisheries and reports made thereon for the

guidance and information of the Food and Drugs Board. Representatives of the Bureau have attended hearings, made depositions, and in other ways cooperated in connection with the enforcement of the food and drugs act, and have attended trials and given expert testimony in fishery cases.

In response to requests coming through diplomatic channels the Department has made donations of trout eggs to various foreign governments, and has acted as intermediary in obtaining for several countries additional supplies of trout eggs from private culturists in the United States. Among the noteworthy shipments have been rainbow-trout eggs to Austria, France, and Germany, where the original stock of this species, introduced from America many years ago, has deteriorated through continuous inbreeding and where there is consequent demand for new stock from wild fish.

Improved shipping cases devised by the Bureau permit the safe transfer of eggs of the salmonoid fishes for long distances without an attendant and with loss that is negligible. Reference may be made to a shipment during the year of 20,000 brook-trout eggs and 40,000 rainbow-trout eggs from western hatcheries to one of the Japanese provinces. A report received through the Japanese embassy in Washington states that only 64 of the brook-trout eggs and 40 of the rainbow-trout eggs perished during the railway, steamship, and final railway journey, and the percentage of strong, healthy fry produced was 97.5 and 93.5, respectively.

FISHERY SUBJECTS BEFORE CONGRESS.

Various subjects relating to the Federal fishery service and the fishing industry have been under consideration by Congress during the past year.

Bills having been introduced for the prohibition of the method of fishing known as beam trawling or otter trawling, and a joint resolution having also been presented calling on the Commissioner of Fisheries to investigate this subject and report to Congress, a hearing was given in May, 1912, by the House Committee on the Merchant Marine and Fisheries. The fishery is of recent development in the United States and is of very limited extent compared with the trawl-net fishery of Europe or with the line fishery of the North Atlantic coast. The adoption of this apparatus is strongly opposed by the line fishermen of New England, and prohibitory legislation is advocated by them on the ground that the method is unnecessarily destructive. The Bureau of Fisheries took the position that the question presents too many phases to be summarily disposed of without careful consideration; that the necessary information on which Congress can act advisedly does not exist; and that authority should be given for an impartial inquiry. Attention was called to the fact that

the matter has an international bearing, and that the cooperation of Canada, Newfoundland, France, and possibly other countries would be required to render effective any restrictive measures that might be decided on. The committee adopted this view, and submitted a favorable report on the joint resolution, with a recommendation for a special appropriation to meet the expenses of the investigation.

Numerous bills providing for new fish hatcheries throughout the country were introduced in Congress and considered by the appropriate committees. A number of the measures were favorably reported, and some of them passed one House, but none had been enacted into law by the end of the fiscal year. It is gratifying to note that the restrictions advocated by the Department in the establishment of fish hatcheries, as referred to in previous reports, have been accepted by committees of Congress and have been incorporated in practically every bill reported.

Protracted hearings have been held by the Senate Committee on Fisheries on a bill embodying amendments to the present laws affecting the fisheries of Alaska and the duties with which the Department is charged in connection therewith. This bill has been drawn because of the growing belief among the fishery interests, and also because of the experience of the Department, that the existing laws do not fully meet the present requirements and conditions. In the bill granting a territorial form of government to Alaska, which has been favorably considered by both Houses of Congress, the fisheries, fur seals, and other fur-bearing animals were expressly exempted from the list of subjects coming within the purview of the territorial legislature.

A bill introduced in the Senate April 17, 1912, and subsequently passed by that House, provided new regulations affecting the use of diving apparatus in the Florida sponge fishery. If this bill becomes a law, citizens of the United States will be prohibited from taking sponges by this means except between October 1 and July 1 of each year, in depths of 40 to 150 feet; and sponges less than 5 inches in diameter may not be taken under any circumstances. These measures were recommended by the Department as important for the conservation of the sponge industry.

Hearings on the fur-seal service, before the House Committee on Expenditures in the Department of Commerce and Labor, which began in May, 1911, continued throughout the fiscal year 1912, and have not yet been concluded. Up to June 30, 1912, 29 hearings had been held, and the testimony was issued in 13 parts comprising 896 printed pages. The correspondence and documents supplied to the committee by the Department in response to the resolution comprise 1,232 printed pages.

During hearings on the bills providing for Federal control over migratory birds, several arguments were presented by State officials

and others favoring the assumption by Congress of jurisdiction over migratory fishes. The inability or failure of the States to afford adequate protection to the fishes in many interstate waters, and the grave condition now confronting some of the most valuable species, appeared to justify this appeal to Congress for relief.

INTERNATIONAL FISHERY AFFAIRS.

Reference has been made in previous reports to the invitation extended to the United States Government to join the Permanent International Council for the Exploration of the Sea. This council is composed of official representatives of most of the countries of western and northern Europe, and is engaged in biological, physical, and statistical studies in the interests of the commercial fisheries. The diplomatic and consular appropriation act for the fiscal year ending June 30, 1913, contains an item authorizing the participation of the United States in this work, by the appropriation of a sum for the pro rata share of this country in the administrative expenses of the council, and for other purposes, including the attendance "of an expert official representative at the annual meeting." The matter has been placed under the jurisdiction of this Department by the Department of State, and the necessary cooperative and independent investigations growing out of this affiliation will be conducted by the Bureau of Fisheries.

A bill giving effect to the convention between the United States, Great Britain, Russia, and Japan for the prevention of pelagic sealing in the North Pacific Ocean was passed by the House of Representatives on February 14, 1912. In addition to reaffirming the provisions of the treaty ratified by the Senate on July 7, 1911, and becoming effective on December 15, 1911, the bill contained clauses with specific provision as to the killing of seals on land.

A representative of the Department from the Bureau of Fisheries was again detailed to go to the so-called treaty coasts of Newfoundland for the purpose of keeping the Government advised regarding the operations of American vessels employed in the herring fishery. This detail was made at the request of the Department of State.

BUREAU OF LIGHTHOUSES.

REORGANIZATION OF LIGHTHOUSE SERVICE.

During the fiscal year 1912 the reorganization of the Lighthouse Service under the provisions of the act of Congress approved June 17, 1910, was practically completed. After two years of operation of the Service under this act it is believed that the efficiency of the Service has been greatly increased, and that the work is much more economically performed.

All of the lighthouse districts, with the exception of the three river districts, are now in charge of civilian inspectors. The selection of thoroughly competent men for positions as lighthouse inspectors is necessary to the success of the plan of reorganization adopted by Congress. The positions are under the classified civil service, and must therefore be filled in accordance with civil-service rules. The desirable qualifications for an inspector, considering the work for which he is to be responsible, include a knowledge of nautical affairs and the needs of navigation; training in civil, mechanical, and marine engineering as required in connection with the construction and repair of lighthouses, docks, storehouses, fog-signal stations, and other structures connected with lighthouse work; a knowledge of marine affairs necessary for the maintenance and repair of light vessels, lighthouse tenders, and floating aids to navigation; business training essential for the administration of a lighthouse district, including the purchase of supplies and ability to judge and handle men. The appointments have been made from the men in the Lighthouse Service or in branches of the Government having similar work, by selecting in each case the best man available, depending solely on his record and his merits with respect to the proportion of these qualifications possessed.

Of the 17 appointments as lighthouse inspectors (including 1 inspector on general duty), 13 were by promotion of persons who had had from five to forty years' experience in the Lighthouse Service, the average length of service being eighteen years. The other 4 were by selection of persons who had had from eight to thirteen years' experience on other Government vessels. Each of the 4 had had command for from four to eleven years, and was engaged in hydrographic work in which he became familiar with the needs of the Lighthouse Service. Of those promoted in the Lighthouse Service, 7 had had from twelve to twenty-three years' experience on vessels of the Service, 5 of them having been masters of lighthouse tenders for from seven to twenty-one years; 5 others were promoted from positions as superintendents in the Service, having had from five to forty years' experience in the engineering and construction work of the Service and from four to twenty-two years in charge of responsible work; 1 was promoted from chief clerk in a lighthouse district, having had twelve years' experience in the Service. Thus, all but 6 of those appointed as inspectors had had extensive and responsible experience on Government vessels, and these 6 had had long experience on vessels in connection with other work of the Lighthouse Service.

On June 30, 1912, there were 5,534 persons employed in the Lighthouse Service, including 81 technical force, 140 clerical and office force, 51 depot keepers and assistants, 1,682 light keepers and assist-

ants, 1,570 laborers in charge of post lights, 5 custodians of reservations, 1,516 on vessels, and 489 construction and repair force.

ADMINISTRATION METHODS AND ECONOMIES.

During the fiscal year systematic inspections were made in the various lighthouse districts by the general inspector as respects the technical work and vessels, and by the examiner as to business methods, property accounts, and clerical organization. The reports of these inspecting officers are made in a uniform manner for each district, and have been reviewed in the Bureau, such portions of them as call for action by the local inspectors in charge being subsequently referred to the various districts. The effects of this work have been of great value in maintaining the vessels and other equipment of the Service at a proper standard, improving and systematizing methods in the district organizations, auditing district property accounts, and examining records.

A standard method of cost keeping has been in effect throughout the fiscal year, having been introduced for the first time in the Lighthouse Service, and reports have been received from all the districts, in which itemized costs of each office, depot, light and fog-signal station, tender, and light vessel are shown separately. The costs of minor lights, daymarks, and lighted and unlighted buoys are shown in groups by various districts, each type of aid to navigation being accounted for separately. In all cases the costs are divided into main headings, "Maintenance" and "Repairs and improvements." The cost of maintenance includes what may be considered fixed charges, such as salaries, rations, fuel, and general expendable supplies. The items of repairs and improvements are further subdivided to show the cost of labor and materials separately for each principal object. By continuing to compile this information from year to year accurate figures can be derived which will be useful in preparing estimates, planning work, effecting economies, and comparing the efficiency of different districts, vessels, apparatus, methods, etc.

A revision of the method of keeping accounts in the Bureau and district offices was made, whereby the condition of allotments under the various appropriations is reported monthly. It is believed that this will tend to eliminate bookkeeping errors and provide for judicious review and distribution of funds so as to attain the best results in the maintenance of the Service.

Arrangements were made to discontinue the use of hard coal on a number of vessels and at power plants and to substitute soft coal, effecting a saving of about $11,000 annually.

A saving in the purchase of mineral oil has been effected by making arrangements for delivery at several points, instead of only at the

general depot, as heretofore. This will result in an economy of about $11,000 annually in freight charges and cost of oil.

To promote efficiency and friendly rivalry among lighthouse keepers, a system of efficiency stars and pennants has been established. Keepers who have been commended for efficiency at each quarterly inspection during the year are entitled to wear the inspector's star for the next year, and those who receive the inspector's star for three successive years will be entitled to wear the Commissioner's star. The efficiency pennant, being the regular lighthouse pennant, is awarded to the station in each district showing the highest efficiency for a year, and may be flown during the succeeding year.

Revised regulations for the Lighthouse Service were put into effect shortly after the beginning of the fiscal year and have proven a great convenience in the operations of the Service. In addition to the regulations, instructions for the personnel of light stations and vessels were issued.

Light lists published during the year have been prepared in a new form, based on a careful consideration of the needs of navigators and a comparison of foreign publications of the same kind. The important features are larger type, simplified descriptions, flat-opening pages, indication of the relative brilliancy of lights by giving candlepower, more systematic and complete introductory notes, and tabular arrangement of light and fog-signal periods.

A medical handbook for the use of lighthouse vessels and stations, which includes a list of medicines and articles to be supplied for medicine chests, has been published.

During the fiscal year a standard schedule of furniture, bedding, and cooking utensils to be furnished keepers at light and fog-signal stations was issued. This list includes stoves and accessories for keepers' quarters, and for all offshore and isolated land stations where families are not permitted to reside a small selection of general furniture, including mattresses and bedding, and cooking utensils, dishes, and tableware are provided.

After careful investigation and consideration of the needs of the Lighthouse Service, a list of stations and vessels to which medicine chests and libraries will be supplied was issued during the year. These provide for furnishing 548 medicine chests and 351 libraries throughout the Service. In this schedule all light vessels and all isolated light stations are provided with both medicine chests and libraries. Lighthouse tenders and light stations distant from towns, but with regular mail facilities, are provided with medicine chests only, and light stations located convenient to towns, with regular mail facilities and near medical attendance, are not provided with either medicine chests or libraries.

A simpler and more definite system for handling property accounts for the Service outside of Washington was put into effect on July 1, 1911.

COOPERATION.

A special effort has been made to consult the needs of maritime interests as to aids to navigation and to cooperate with other branches of the Government having interest in or relations with the work of this Service.

During the period of reorganization the Navy Department cooperated effectively in the matter of the detail of naval officers as inspectors. Arrangements have also been made with the Hydrographic Office of that Department for the prompt reporting of any information which may affect aids to navigation under the Lighthouse Service.

Excellent cooperation has also been had with the Corps of Engineers, War Department, respecting the furnishing of information by local engineer officers in matters affecting aids to navigation maintained by the Lighthouse Service and temporary aids established in connection with channel improvements.

Arrangements were made with the Public Health Service for conferences with lighthouse inspectors in regard to medical questions and matters of sanitation relating to the proper maintenance of the lighthouse property, and that Service also cooperated in the preparation of the medical handbook and the list of contents of medicine chests.

Cooperation has been had with the Forest Service in connection with the examination of lighthouse reservations with respect to forestation.

LEGISLATION AFFECTING THE LIGHTHOUSE SERVICE.

In addition to the enactment of the maintenance appropriations at the last session of Congress, appropriations for light vessels for general service aggregating $380,000 were made; also appropriations for fog signal and quarters at Point Loma, Cal., $17,500; for the completion of Thimble Shoal, Va., Light Station, $39,000; for completing the aids in the Cape Fear River, N. C., $30,000; and for repairing aids in the St. Marys River, Mich., $60,000.

Authority was granted for the use of the appropriation of $200,000 for one tender, heretofore made, for the construction of two tenders for general service, and also for the use of the appropriation of $60,000 for a tender for the thirteenth lighthouse district, heretofore made, for constructing a tender for general service. The appropriation of $125,000, heretofore made, for the establishment of range lights in Fort McHenry Channel, Md., was made available for the establishment of gas buoys and other aids to navigation in the chan-

nels leading to Baltimore, and the former appropriation of $15,000 for a dock for the lighthouse depot at San Juan, P. R., was made available for improvement of the new depot at that place.

The purchase from the State of Texas of land adjoining the Aransas Pass Light Station was authorized, as was the reconveyance to private parties of certain lands in Chippewa County, Mich., no longer needed for lighthouse purposes.

Post lights on the St. Croix River and Lake St. Croix, Wis. and Minn., were authorized.

The Secretary of Commerce and Labor was authorized to designate some officer of the Bureau of Lighthouses to perform the duties of the Commissioner during the absence of the Commissioner and Deputy Commissioner.

The benefits of the act of May 30, 1908, entitled "An act granting to certain employees of the United States the right to receive from it compensation for injuries sustained in the course of their employment," were by the act of July 27, 1912, extended to persons employed in any hazardous employment in the Lighthouse Service. This affords much-needed relief to employees injured in hazardous work in this Service.

The purchase was authorized, from the appropriations for the Lighthouse Service, of clothing for the crews of vessels, to be sold to the employees of the Service, and the appropriations reimbursed.

The reimbursement of keepers of light stations and masters of light vessels and of lighthouse tenders for provisions and clothing furnished shipwrecked persons who may be temporarily provided for by them was authorized.

Commutation of subsistence on lighthouse vessels was authorized. Money accruing from this commutation may be paid on proper vouchers to the person in charge of the mess. This arrangement conforms to similar practice on other Government vessels.

APPROPRIATIONS.

Recommendation was made for the consolidation of all maintenance appropriations for the Lighthouse Service under one heading of "General expenses." This, however, was not authorized by Congress, and the appropriations made for the fiscal year 1913 were divided into one appropriation for general expenses of supplies, repairs, etc., and three appropriations for salaries. The estimates for the year 1914 have been submitted in a form similar to the appropriations for the present fiscal year, but with an alternative providing for all maintenance appropriations in a single item, by which it is believed a more economical and efficient administration of the Lighthouse Service can be effected.

Besides the estimates for maintenance, estimates for 34 special works have been submitted aggregating $1,736,100. These include 1 new lighthouse tender, 1 item for 2 light vessels, 6 new light and fog-signal stations, 1 new light station, 2 new lighthouse depots, 2 items for establishing or improving aids in general localities, 4 items for new systems of harbor or channel lights and other aids, 13 items for improvement of light or fog-signal stations or of groups of aids to navigation, and 4 items for improvements at lighthouse depots.

INCREASE IN AIDS TO NAVIGATION.

The work of improving and increasing the number of aids to navigation in Alaska has progressed steadily, notwithstanding the loss of the tender *Armeria*, which was a severe loss to the Service, as this vessel was well adapted for Alaskan waters. The total number of aids in Alaska, including lights, fog signals, buoys, and daymarks, in commission at the close of the fiscal year was 265, an increase of 65 per cent over the number maintained on July 1, 1910. Of these aids 85 are lights, representing an increase of 130 per cent in lighted aids since the same date.

During the fiscal year ended June 30, 1912, there was a net increase of 582 in the total number of aids to navigation maintained by the Lighthouse Service, including 41 lights above the order of post-lantern lights, 4 fog signals, 3 submarine bells, 153 daymarks, 60 lighted buoys, 134 unlighted buoys, and 187 post-lantern lights. Fixed lights were changed to flashing or occulting at 35 stations. The illuminant of 39 lights was changed to incandescent oil vapor, and the illuminant of 44 lights was changed to acetylene or other gas. One light vessel was reestablished during the year. On June 30, 1912, there were maintained by the Lighthouse Service 12,824 aids to navigation, including 4,516 lights of all classes and 553 fog signals, of which 43 are submarine signals.

The following are some of the more important aids which have been established or materially improved during the past fiscal year:

Staten Island (Ambrose Channel Outer Range Rear), N. Y.: Incandescent oil-vapor light of 300,000 candlepower established.

Punta Gorda, Cal.: Incandescent oil-vapor light of 96,000 candlepower established.

Frying-Pan Shoals Light Vessel *No. 94*, N. C.: New light vessel placed on station.

Bush Bluff Light Vessel, Va.: Reestablished.

Cape Elizabeth Light Vessel *No. 74*, Me.: Changed to flashing light.

Fenwick Island Shoal Light Vessel *No. 52*, Md.: First-class compressed-air siren installed.

Point Hueneme, Cal.: First-class compressed-air siren established.

Barnegat, N. J.: Combination gas, aerial whistle, and submarine bell buoy established.

Other important combination gas and whistling buoys established: Point Vincente, Cal.; Peaked Hill Bar, Mass.; Manana Island, Me.; Orford Reef, Oreg., and Willapa Bay, Wash.

System of buoyage extensively rearranged and improved in important harbors: Salem, Mass., Charleston, S. C., Duluth-Superior, Minn.-Wis., San Juan, P. R., San Francisco Entrance, Cal., San Diego Entrance, Cal., Tampa Bay, Fla., Grays Harbor, Wash., Doboy Sound, Ga., and Pearl Harbor, Hawaii.

Flashing acetylene lights established: Stikine Strait, Beauclerc, Cape Strait, Dewey Rock, Cape Chacon, Mellen Rock, Ocean Cape, Tenakee Inlet, Turnabout Island, Zaikof Point, Alaska; Eagle Point Range, Delaware River, N. J. (2 lights); Belfast Harbor, Me.; Richardson Rock, Cal.; Anacapa Island, Cal.; Maui Island, Hawaii, and Kauai Island, Hawaii.

Fourth-order lights established: Pago Pago Harbor Range, Tutuila Island, Samoa (2 lights).

Fog bells established: Castle Rocks, Boston Harbor, Mass.; Plattsburg Breakwater, Lake Champlain, N. Y.; and White Shoal, Lake Michigan, Mich. (submarine bell).

ENGINEERING AND CONSTRUCTION WORK.

A number of new works under special appropriations were in progress at the close of the fiscal year. Those of principal importance are as follows: New fog signal at Manana Island, Me.; wharf, power house, and foundry at the General Lighthouse Depot, Tompkinsville, N. Y.; new lighthouse at Miah Maull Shoal, Delaware Bay, N. J.; new lights for Cape Fear River, N. C.; new lighthouse and fog signal at Buffalo Breakwater, N. Y.; new lighthouse and fog signal, with 3 minor lights, at Superior Entry, Wis.; 10 beacon lights and 13 buoys for Livingstone Channel, Detroit River, Mich.; about 15 new acetylene lights for Alaska; new lighthouse and fog signal for Lincoln Rock, Alaska; new light and fog signal, Alki Point, Puget Sound, Wash.; new lighthouse and fog signal at San Pedro Breakwater, Cal.; new lighthouse, Kilauea Point, Hawaii.

In all new construction work now in progress it is sought to eliminate so far as practicable the use of perishable materials, and to erect all structures in as substantial and permanent a manner as possible, to avoid necessity for future repairs. Fireproof construction has been employed, and modern illuminating and fog-signal apparatus installed.

With a view to systematizing the design and construction of minor structures, standard plans and specifications were prepared and dis-

tributed for structural steel and pipe towers, and for concrete piles for use either as single piles or in combinations.

Arrangements were also made for the adoption, so far as practicable, of the standard plumbing specifications developed by the Treasury Department for use in public buildings, and the standard specifications for Portland cement developed by a committee representing various Government departments under the general auspices of the Bureau of Standards of the Department of Commerce and Labor.

During the year arrangements were completed with the Bureau of Mines for the regular testing of coal used in the Lighthouse Service. Cans for samples are furnished by the Bureau of Mines and distributed to various tenders, etc., throughout the Service, and when filled are returned to the Bureau of Mines for analysis as to thermal content, percentage of ash, volatile matter, fixed carbon, and sulphur. Where large purchases of coal are made, as at the General Lighthouse Depot at Tompkinsville, the coal is paid for on the basis of results revealed by these analyses. It has not been found practicable to apply this method to small purchases of coal, but it is believed that the effect of taking the samples and furnishing the dealers with copies of the analyses has been that a superior quality of coal for lighthouse purposes is obtained.

A compilation of approximate hours of fog at all stations throughout the Service during the past 27 years has been made. These figures present interesting statistics, and are of value in approximating the prevalence of fog at various localities when proposed new fog signals are under consideration. The maximum record for a year is at Seguin, Me., 2,734 hours in 1907, equivalent to about 30 per cent of the entire year. Fog is more generally prevalent throughout the first lighthouse district (coast of Maine) than any other.

Detailed instructions were issued covering water-pressure tests of gas buoys and tanks, which are to be made every three years.

IMPROVEMENT OF APPARATUS.

Service tests have been made of an automatic submarine bell mechanism attached to a buoy in which a vane operating the hammer is protected by a casing, and as the buoy rises and falls on the waves the vane is forced up and down, causing a spring to stretch. At a certain point this spring is released, and a blow is struck. All blows are of equal intensity, being due to the elongation of the spring, although the interval between blows varies with the condition of the sea. The bell rings uninterruptedly and independently of the condition of the weather, and from reports received has been heard for distances of 10 to 15 miles. One such submarine bell buoy is in commission.

Steps have been taken to encourage American glass manufacturers in the production of lighthouse lenses, which have heretofore been purchased abroad. Experimental lenses have been ordered, and when completed will be given a service trial. A considerable economy in cost is expected.

Two methods for changing fixed to occulting lights have been further used at various stations, by revolving opaque screens within a fixed lens and by revolving the lens itself, certain glass panels having been removed and their places filled with screens. The screens are given the proper openings to produce the desired characteristic. By these methods it is possible to change lights heretofore fixed to occulting lights at small expense, saving the cost of new lenses. Fixed lights are often objectionable on account of the possibility of confusion with other lights on shore.

To facilitate the replacing of light vessels on exposed stations in foggy weather, whistling buoys have been introduced as marking buoys for several important light-vessel stations.

Automatic pressure and recording gauges have been installed at a number of fog-signal stations. These gauges are fitted with circular charts upon which a pen automatically indicates the exact times during which the signal is operated.

Experiments are under way with devices designed to summon light keepers by ringing an electric bell when lights are not burning properly, either too high or too low.

The use has been extended of submerged buoys in order to relieve the strain on moorings of exposed light vessels. A spherical buoy is employed, shackled to the mooring chain, thus supporting a great part of the weight, raising the chain clear of the bottom, and acting as a spring when the vessel strains at her moorings in heavy weather.

An additional installation has been made of an electrically operated fog bell actuated by a mechanical tripping device from a power house on shore. A telltale electric lamp on a switchboard in the power house indicates by its light whether the bell is in operation.

Experiments are under way with a double mirror intended to increase the intensity of occulting lights and lengthen the duration of light in flashing lights.

Enameled metal signs warning persons against damaging lighthouse property have been distributed for use at stations not having resident keepers.

The use of standard padlocks for unwatched lights, isolated structures, etc., where a keeper is not constantly in attendance, has been introduced. By this system access to such structures can be had at all times by authorized persons.

A new type of cast-iron post light has been designed for use on ends of breakwaters in exposed positions in connection with unwatched lights.

A new shoal-water type, combination acetylene gas and bell buoy, with large gas capacity, has been designed. One buoy of this type has been built and given a preliminary test, and has so far proved to be satisfactory.

VESSELS.

Under date of May 10, 1912, the Attorney General rendered an opinion holding that the employment of laborers and mechanics in making repairs to Government vessels is employment upon a public work of the United States, and is therefore subject to the restrictions of the act of August 1, 1892 (27 Stat., 340), known as the "eight-hour law." As many shipyards operate under a nine-hour day, some difficulty has been experienced in arranging for contracts for such work.

One new tender, the *Camellia*, was completed during the year and assigned to duty in the Gulf of Mexico, and one new light vessel, *No. 82*, was placed on station off the entrance to Buffalo Harbor, N. Y. Plans and specifications for light vessel *No. 96* were prepared and proposals invited. The Bush Bluff Light Vessel was replaced at the entrance to Norfolk Harbor, and steps have been taken to improve the lighting apparatus of light vessel *No. 97*, which will be placed on that station during the present fiscal year. Plans are under way for the construction of light vessels *No. 98*, *No. 99*, *No. 100*, and *No. 101*, and also for the construction of four new tenders.

The tender *Woodbine* is under construction, and it is expected will be ready for service during the coming fiscal year, the completion having been delayed by the failure of the contractor.

Milwaukee Light Vessel *No. 95* is nearly completed and will be placed on station during the present fiscal year.

On November 23, 1911, the tender *Lily* was wrecked by striking a snag in the Missouri River while engaged in work of establishing aids to navigation on that river. The machinery and miscellaneous articles of equipment were saved, but the hull was a total loss.

On May 20, 1912, the tender *Armeria* struck a submerged rock off Cape Hinchinbrook Light Station, Alaska, while delivering coal to that station, and became a total loss, with the exception of miscellaneous supplies and equipment.

LIGHTHOUSE DEPOTS.

During the fiscal year improvements were made at the General Lighthouse Depot, Tompkinsville, N. Y., by building a power house and foundry. An extension to the dock will be commenced shortly.

The wharf at Edgemoor Depot, Del., was also under reconstruction.

Sites for depots at San Juan, P. R., and Ketchikan, Alaska, were reserved by Executive order.

SAVING OF LIFE AND PROPERTY.

During the fiscal year 1912 services in the saving of life and property were rendered and acts of heroism performed by employees of the Lighthouse Service on vessels or at stations on 37 occasions.

On October 24, 1911, Mrs. Ida Wilson Lewis, keeper of the Lime Rock Light Station, R. I., died at her station, aged 69 years. She resided at the station from the age of 12, and succeeded her mother (who had previously succeeded her father) as keeper in 1879. She was perhaps the most widely known lighthouse keeper in the United States, having saved at least 13 persons from drowning on different occasions, for which she was presented with medals and other tokens.

COAST AND GEODETIC SURVEY.

GEODETIC WORK.

Rapid progress was made in the work of reconnoissance for primary triangulation of the arc extending along the one hundred and fourth meridian from Denver, Colo., to the Canadian boundary. This work began May 2, 1911, and closed August 10, 1911, during which period 720 miles of reconnoissance were completed, 300 miles of which was done after June 30. In the main scheme there are 74 stations and in the supplementary scheme 23. Provision was made for the usual connection with other systems of triangulation and with the State boundaries.

Following this work, a reconnoissance was made for primary triangulation to extend from the transcontinental triangulation in Utah to the Texas-California arc of primary triangulation in the vicinity of Needles, Cal., a distance of 310 miles. Provision was made for connection with stations and monuments of existing surveys. The time occupied in this work was one month and six days.

A reconnoissance was then made for a scheme of primary triangulation to extend from the oblique arc in the vicinity of Huntsville, Ala., to Memphis, Tenn., a distance of 232 miles; after which a reconnoissance was made for a primary traverse from Memphis to Little Rock, Ark. The length of this reconnoissance is 123 miles. The reconnoissance from Huntsville to Little Rock was made between November 8, 1911, and February 29, 1912, a period of 3 months and 22 days.

The total length of reconnoissance was 965 miles.

In May, 1912, observations were begun on the primary triangulation near the one hundred and fourth meridian by two parties work-

ing from the northern and southern ends of the arc, respectively. A signal-building party preceded the observing parties.

During the year the scheme of secondary triangulation from Tacoma, by way of Grays Harbor, to Willapa Bay, Wash., was completed. The area covered has long been in need of an adequate control for surveys and maps. This chain of triangulation is 140 miles in length and all of the observing was done during the fiscal year. This was a difficult piece of work, owing to the very high timber, fog, rain, and the great amount of smoke from forest fires.

The triangulation was completed on the Neuse River, N. C., which was necessary to connect the work of the United States Engineers, affecting navigation, with the triangulation of the Coast and Geodetic Survey.

Two parties were engaged in the revision of triangulation on the coast of Texas during a portion of the year. Several parties engaged on chart revision and hydrography also did some work of triangulation.

At the request of the General Land Office, the latitude and longitude of a point near Copper Center, Alaska, were determined by two cooperating observers. Longitudes were determined telegraphically by the same parties at stations in Fort Stevens, Oreg.; Jarilla, Boracho, Stanton, Matagorda, and Sabine, Tex.; and the astronomic latitude was determined at six stations of the Texas-California arc of the primary triangulation.

An important event of the year was the completion of a three years' campaign of gravity determinations, during which 77 stations were established in the United States. Previous to 1909, when the recent gravity work was begun, only 47 stations in this country had been occupied with the invariable pendulums. During the fiscal year 1912 gravity determinations were made at 18 stations.

The line of precise levels from El Reno, Okla., to Goffs, Cal., was completed during the year. It furnishes a second and almost independent connection between the Gulf of Mexico and the Pacific Ocean.

Excellent progress was made on the line of precise levels from Brigham, Utah, toward San Francisco, Cal. Work on this line was begun in July, 1911, and by the close of the season 302 miles of levels between Brigham, Utah, and Beowawe, Nev., had been completed. Work on this line was resumed from the San Francisco end in March, 1912, working eastward, and by the end of the year about 300 miles of leveling had been run.

The Survey has made a contribution to geodesy in the publication entitled "The Effect of Topography and Isostatic Compensation upon the Intensity of Gravity" (Special Publication No. 10), which was available for distribution in May, 1912. A preliminary report

on this subject was submitted to the International Geodetic Association at its meeting in 1909. In Special Publication No. 10 the new method of making gravity reductions (in which topography and isostatic compensation are considered) is explained at length and the necessary reduction tables are given in detail. The results of this investigation supplement and agree with the results obtained from the investigations by this Survey of the deflections of the vertical, which were published as "The Figure of the Earth and Isostasy, from Measurements in the United States," and "Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy."

A second investigation of the effect of topography and isostatic compensation has been made by this Survey, using all of the 124 stations now available in the United States. The results obtained from this investigation are in close agreement with those of the first investigation, where only 89 stations were used. The most important result given in the latest publication is the derived value of the flattening of the earth when the new method is used. The value agrees remarkably well with the generally accepted best values of the flattening, although in the present case the number of gravity stations used is small and the range of the latitudes of these stations is only about 24°. A report on this latest investigation has been published.

The following publications have been issued since the close of the fiscal year: "The Texas-California Arc of Primary Triangulation" and "Geodetic Operations in the United States, 1909–1912." A manual on the "Determination of Time, Longitude, Latitude, and Azimuth" has been prepared for publication.

Three appendixes relating to the triangulation were published in the Superintendent's annual report for the fiscal year 1911, viz, "Triangulation Along the Ninety-eighth Meridian, Nebraska to Canada, with Connection with the Great Lakes," "Triangulation Along the Ninety-eighth Meridian, Seguin to Point Isabel, Tex.," and "Triangulation Along the East Coast of Florida and on the Florida Keys."

An enlarged edition of the "Formulæ and Tables for the Computation of Geodetic Positions" was prepared and published during the year.

MAGNETIC WORK.

The magnetic observatories at Cheltenham, Md.; Tucson, Ariz.; Honolulu, Hawaii; Sitka, Alaska; and Vieques, P. R., were in operation throughout the year. Seismographs were kept in operation and meteorological observations were made at all the observatories.

Special rapid-rate registration was carried out on specified term days each month in conformity with requests for international cooperation in connection with the English Antarctic Expedition

and with the Australasian Antarctic Expedition, both of which were still engaged in magnetic observational work in the Antarctic regions at the close of the fiscal year.

Instruction in magnetic work was given at Cheltenham to an observer who is preparing for the Crocker Arctic Expedition, to be sent out next summer. At the same observatory a number of magnetic instruments were standardized for the use of the Survey.

The magnetic elements (declination, dip, and horizontal intensity) were determined at over 300 stations. The stations were distributed, in accordance with present needs, over 32 States and Territories and outlying islands under the jurisdiction of the United States. About 60 stations were reoccupied during the year for the purpose of obtaining data for maintaining an adequate knowledge of the secular change of the magnetic elements, especially of the magnetic declination. Special parties worked in Porto Rico and the Philippines for this purpose.

The magnetic work done at sea during the year by the vessels of the Survey was, as in past years, incidental to the regular work upon which they were engaged, and the magnetic observations were made when the vessels were cruising to and from their working grounds, or, where opportunity offered, on their working grounds.

All of the vessels in the service which are suitable for it are instructed during each season's work to make such magnetic observations, especially of the magnetic declination, as there is opportunity for doing, either at sea or on land, when the weather conditions and the requirements of their survey duties permit. The *Bache*, on the Atlantic coast, and the *Patterson* and *Explorer*, on the Pacific coast, are supplied with sea dip circles for the determination of dip and total intensity at sea. The two latter ships are also equipped with magnetometers for magnetic work on land. During the last few years many declination observations have been secured in the inland passages through British Columbia and southeastern Alaska. A valuable series of sea results were also obtained on the recent trip of the *Patterson* to and from her season's work at Panama. Several shore stations were made at Panama, and two swings of the ship were made in Panama Road and vicinity.

HYDROGRAPHIC AND TOPOGRAPHIC WORK.

The steamer *Bache* was engaged in hydrography in the vicinity of New Ground Shoals, The Quicksands, and Rebecca Shoal on the coast of Florida; search for reported shoals off Brunswick, Ga., in the vicinity of Diamond Shoals Light Vessel, and off Hunting Island and Cape Romain; offshore hydrography between Delaware Bay entrance and Chesapeake Bay entrance; hydrography of

entrance to Winyah Bay, S. C.; hydrography of entrances to Doboy and St. Simons Sounds. The *Bache* was undergoing repairs from August 29 to September 3.

The steamer *Endeavor* was engaged on hydrographic work in Chesapeake Bay in the vicinity of Tangier Island and Kedges Strait; off Cape Charles; Tail of the Horseshoe Shoal; and resurvey of Elizabeth River from Norfolk to the entrance to the canals. Repairs were made between August 29 and September 5.

The steamer *Hydrographer* was laid up at Curtis Bay, Md., during the greater part of the year. On April 13 she was taken to Baltimore for minor repairs, and on April 26 sailed from Baltimore for Key West, Fla., via the inland route from Norfolk to Beaufort, N. C., to take up the field revision of Coast Pilot, Volume VII, which work was in progress at the close of the year.

The schooner *Matchless* has been employed on the revision of the survey of the York River, Va., and of its tributaries, the Pamunkey and Mattaponi. The survey of the Mattaponi River was completed June 10 and the vessel proceeded to Baltimore for repairs, which began June 27. The *Matchless* was under repairs at Baltimore from July 1 to August 7, 1911.

A wire-drag party was engaged during the summer in work in the vicinity of East Penobscot Bay, Me., and during the winter in the approaches to the Panama Canal. In the spring work was begun in the channel between Montauk Point and Block Island, N. Y.

A revision was made of the triangulation of Casco Bay, Me., and the position of aids to navigation determined.

Revision of triangulation, topography, and hydrography was continued at Cape Neddick Road, Me., southward to include York Harbor, and on the coast of Massachusetts north of Cape Ann.

The revision of surveys between Cape Charles and Cape Henlopen, in progress at the beginning of the fiscal year, was completed on August 8 and work was begun on the revision of the triangulation and topography of the Delaware River from Bridesburg to Trenton.

Except when detailed to duty with the Mississippi River Commission or other special duty, an officer of the Survey has been engaged throughout the year on the chart revision of Greater New York. This officer also served as a United States delegate at the International Congress of Navigation at Philadelphia in May, 1912.

An examination to obtain data for sailing directions and to supplement the information on the charts was made of the inland waterways between the Capes of the Chesapeake and Key West, Fla.

At the request of the North Carolina Fish Commission an officer was detailed to replace the buoys and beacons marking the limits of fishing grounds in Croatan and Pamlico Sounds.

An officer of the Survey has continued on duty in cooperation with the Maryland Shell Fish Commission, in the preparation of reports, charts, and other data for publication.

A resurvey of the shore line and adjacent hydrography at Davids Island, N. Y., was made at the request of the officer in command at Fort Slocum.

The steamer *Explorer* was employed on a survey of the Kuskokwim River, Alaska, during the season of 1911 and again in 1912. This vessel was undergoing repairs from July 1 to 5, 1911, and in February, 1912.

The steamer *Gedney* made a survey of Willapa Bay entrance, Wash., and of Wrangell Strait and Tongass Narrows, Alaska. Some minor repairs were made during the year. The steamer *Cosmos* and launch *No. 117* were employed in connection with the *Gedney*.

The steamer *McArthur* was employed in surveys on the west side of Cook Inlet, Alaska. During the spring the vessel was repaired at Seattle and Winslow. A speed trial course in Port Townsend Bay was measured in compliance with a request from the Navy Department. In June, 1912, a survey was made of the water front of Douglas and Treadwell, Gastineau Channel, Alaska. Work was afterwards begun between Resurrection Bay and Cook Inlet.

During the season of 1911 the steamer *Patterson* was at work in the vicinity of Dolgoi and Sannak Islands, Alaska. A search was made for the Leonard and Anderson Rocks. The vessel was afterwards employed on a survey of the approaches to the Panama Canal. The *Patterson* was undergoing extensive repairs from June 4 to the close of the fiscal year.

The steamer *Taku* completed the surveys in the vicinity of Naked Peak and Storey Islands, Prince William Sound, Alaska, made a search for a reported rock, and developed a shoal near Little Smith Island. Work was also done at Green Island and in Land-Locked Bay. In June, 1912, the position of the wreck of the Lighthouse steamer *Armeria* near Cape Hinchinbrook, Alaska, was determined. Regular surveying work in Prince William Sound was in progress at the close of the year.

The steamer *Yukon* was engaged in the survey of Cook Inlet, Alaska, south of the West Foreland. Work was resumed in Alaska in May, 1912, and was in progress at the close of the fiscal year.

A wire-drag examination was made in San Luis Obispo Bay, Cal. Chart revision work was done at San Pedro and Port Harford, Cal.

In October, 1911, a party was sent to the Hawaiian Islands to continue the revision of the triangulation and topography. Work on the Island of Maui was in progress and nearing completion at the close of the fiscal year. The collection of Coast Pilot Notes for the Hawaiian Islands was completed, and the notes have been published.

An officer stationed at San Francisco has served as inspector for the coast of California and has also had charge of the San Francisco suboffice. An officer stationed at Seattle has performed similar duty for the coasts of Oregon and Washington and has supervised the repairs and outfitting of the vessels of the Survey employed in Alaska.

The following publications relating to hydrography and topography were received from the printer and placed on sale during the fiscal year:

United States Coast Pilot, Parts I–II, third edition.
United States Coast Pilot, Part III, third edition.
Coast Pilot Notes on Hawaiian Islands.
Supplement to Coast Pilot, Part IV.
Supplement to Coast Pilot, Part V.
Supplement to Coast Pilot, Part VI.
Supplement to Coast Pilot, Part VII.
Supplement to Coast Pilot, California, Oregon, and Washington.
Supplement to Coast Pilot, Alaska, Part I.
Leaflet, Inland Waterways, Atlantic Coast.

TIDAL AND CURRENT WORK.

Tide observations have been made with self-registering tide gauges at Portland, Me.; Fort Hamilton, N. Y.; Atlantic City, N. J.; Philadelphia, Pa.; Baltimore, Md.; Fernandina, Fla.; Galveston, Tex.; San Diego, Cal.; San Francisco, Cal.; Seattle, Wash.; and Juneau, Alaska; and at stations temporarily occupied in connection with the work of the field parties. Current observations have been made at a number of stations by vessels of the Coast and Geodetic Survey and by observers on light vessels stationed along the Atlantic coast, by an arrangement entered into with the Bureau of Lighthouses.

The discussion of tidal and current observations and the preparation and publication of the annual tide tables and of current data for the coast pilots and charts has been continued.

OUTLYING TERRITORY.

The director of coast surveys in the Philippine Islands, whose office is at Manila, has immediate direction of the details of the field and office work in those islands, under general instructions from the Superintendent, and makes plans for field work and issues instructions to field parties. The results of observations made in the field are computed and discussed in the office at Manila, and drawings for new charts are prepared and transmitted to the office at Washington for publication. Sailing directions and notices to mariners for the Philippine Islands are prepared and published at Manila.

Cooperation is maintained with the various bureaus of the insular government and with the military and naval authorities in the islands.

The collection of data in regard to geographic names and in relation to the geography of the Philippine Islands are among the important functions incidentally performed by the Coast and Geodetic Survey.

The progress of the work of the field parties is detailed in the abstracts which follow: The steamer *Pathfinder* was engaged in surveys on the southeast coast of Negros, and on the east and southeast coast of Mindanao; the steamer *Fathomer* was engaged in work in the area between Tablas, Panay, Masbate, and between Romblon and Masbate Islands; also between Panay and Mindoro and the Calimanes and Palawan Islands; the steamer *Romblon* made surveys in the area bounded by the islands of Luzon, Burias, Masbate, Sibuyan, and Tablas; the steamer *Marinduque* was employed in Basilan Strait, Iligan Bay, and Ragay Gulf; the steamer *Research* surveyed in the area bounded by Samar, Leyte, Biliran, and Masbate Islands. One party was engaged in work of triangulation on the island of Mindanao and another in magnetic observations on the island of Luzon.

A permanent magnetic observatory is maintained by the Coast and Geodetic Survey at Vieques, P. R. No other work was done during the year on this island, the surveys of which are complete.

The survey of the island of Maui, Hawaiian Islands, has been nearly completed.

A permanent magnetic observatory is maintained by the Coast and Geodetic Survey at Honolulu.

Through the courtesy of the surveyor general of Hawaii, tidal observations made by the territorial government are furnished to the Coast and Geodetic office.

Two parties were engaged in surveys of the approaches to the Panama Canal on the Pacific side; one party on the steamer *Patterson* and the other a wire-drag party. A careful hydrographic survey was made and all shoal areas were examined in detail with the wire drag.

INTERNATIONAL BOUNDARIES.

United States and Canada boundary.—In the survey of the boundary line between the United States and Canada the following progress was made:

The party employed on the boundary between Maine and New Brunswick continued work in the region between Woodland and Vanceboro; and from the lower end of Grand Lake to the mouth of Monument Stream. Some triangulation was also done in North Lake. In the meanwhile a Canadian party was at work on Mud Lake and Chiputneticook Lake.

On the same boundary a second party completed the survey in the valley of the St. Francis River, about 18 miles of the boundary, not including work by the Canadian party in the field at the same time,

and made about 4 miles of line measurement to the southward and westward of Lake Pohenegamook.

In the section of the boundary between Pigeon River and Lake of the Woods, separating the State of Minnesota from the Province of Ontario, surveys were completed from Pine Lake to Saganaga Lake, a distance of approximately 30 miles.

A Canadian party, in cooperation with an American surveyor, operating on the boundary between North Dakota and Manitoba and Minnesota and Ontario, made about 120 miles of progress, from monument No. 170 on Turtle Mountain to monument No. 70 west of and near Red River, and from the North West Angle Inlet, Lake of the Woods, to below the mouth of the inlet, a distance of about 3 miles.

One party engaged in triangulation and monument setting of the boundary line between Manitoba and Montana, North Dakota, and Minnesota began work about 40 miles east of the east branch of Poplar River and closed operations in the neighborhood of Short Creek, a distance of approximately 100 miles; also from the vicinity of Emerson, Manitoba, west of the Red River, eastward to monument No. 47, a distance of about 25 miles. Another party engaged in the topography and vista cutting of the same section of the boundary line completed the work from the east fork of Poplar River to monument No. 29, a distance of about 124 miles, and from the vicinity of Emerson, Manitoba, to monument No. 31, a distance of 34 miles.

Alaska boundary.—A Canadian party, in cooperation with an American surveyor, engaged in the surveying and marking of the boundary line in Portland Canal, separating Alaska from British Columbia, placed in position 22 reference monuments, the sites of which were determined by triangulation. A topographic survey of the region adjacent was begun.

Two parties have been at work on the Alaska boundary in the Mount St. Elias and Mount Natazhat region, one engaged in triangulation and the other in topography.

On the northern part of the one hundred and forty-first meridian boundary between Alaska and the Yukon Territory about 164 miles of the boundary were surveyed and monumented. The line projection was carried from station "P" of the boundary to station "Y," on the last high ridge overlooking the Arctic Ocean.

CHART PRODUCTION.

During the year satisfactory progress has been made in the preparation of the new series of charts on the mercator projection, oriented with the meridian and having a single depth unit, for the Atlantic and Pacific coasts, and in the correction of existing charts.

An increased number of charts has been published by lithography, and the complete substitution of metal lithographic plates for stone has increased the rapidity of production.

The total issue of charts was 144,425, an increase of 18,000 over that for the previous year. A new edition of the Catalogue of Charts is in press.

ASSISTANCE RENDERED IN SAVING LIFE AND PROPERTY.

On June 17, 1911, the Coast and Geodetic Survey steamer *Explorer* extinguished a fire in the coal bunkers of the U. S. Army transport *Thomas*, then undergoing repairs in Oakland Creek, Cal.

On June 9, 1911, a boat from the steamer *Explorer* rescued 26 students from a burning launch in Seattle Harbor, Wash.

In October, 1911, the steamer *Bache* pulled a stranded schooner off a shoal in the Patuxent River.

On June 14, 1912, the steamer *Yukon*, at work on the coast of Alaska, received reports that as the result of the eruption of Katmai volcano, the people on Kodiak Island were in distress. The *Yukon* immediately proceeded to Kodiak and offered to assist the revenue cutter *Manning* in any duty that would aid the inhabitants. The conditions at Kodiak had been much exaggerated, and although there had been a fall of ashes, about 18 inches deep, at Kodiak the people were not in serious danger. At the request of the commander of the *Manning*, the *Yukon* transported mail and provisions to the relief station at Afognak.

BUREAU OF NAVIGATION.

TONNAGE OF THE MERCHANT MARINE.

On June 30, 1912, the total documented merchant shipping of the United States comprised 26,528 vessels of 7,714,183 gross tons, an increase of 75,393 tons during the year. The recent growth of our shipping has been relatively slow, due partly to causes working here and abroad and partly to diminished construction on the Great Lakes, but the construction in the past four years of steel steamers, aggregating 534,000 gross tons, has increased the efficiency of our merchant fleet much beyond the increase indicated by tonnage figures.

During the past fiscal year our shipyards built 1,505 vessels of 232,669 gross tons. The period of depression in the industry both here and abroad, mentioned in two previous reports, is apparently at an end, and the outlook for the current year is encouraging. The steel tonnage building or under contract on July 1, 1912, was 80,000 tons greater than similar tonnage on July 1, 1911, indicating a return to the normal annual output. The product of British and German yards for 1913 probably will be the largest on record.

The building of 20 oil-tank steamers is an especially encouraging feature of our current construction. Great Britain's coal mines are one of the sources of her maritime supremacy, but increasing use of oil as fuel, shown both by the construction of tank steamers and by the conversion of steamers from the use of coal to oil, will enable the United States with its great oil fields in some measure to offset that advantage. To handle coal requires about twice as many men as it does to supply oil as fuel on shipboard, and the change is calculated to reduce the difference in wages which has been a handicap on American competitive shipping since steam so largely supplanted sail.

FREE SHIPS.

The policy to admit foreign-built ships to American registry to engage in the foreign trade, and to admit free of duty all materials for American ships and shipbuilding, which was recommended in this report last year, was adopted by Congress in the Panama Canal act of August 24, 1912. Time enough has not elapsed to judge the effect of these measures. The free-registry section, with other provisions of law, requires with the change of flag a change in the officers of the ship, and enlarges the field of employment for American deck officers and engineers. Such changes a prudent shipowner will make gradually, prompted by regard for faithful alien officers long employed and by caution in the selection of Americans to fill their places. Immediate change of flag on a considerable scale, accordingly, is not anticipated. The statute also restricts the registry privilege to ships not over five years old, so that additions to our fleet from foreign sources will not be represented by old ships at the bottom of the lists of foreign shipowners, for which purchasers are sought, but in the main by new ships, built according to new and improved designs. The new law will no doubt work slowly for this reason, but upon the principle of selection better results may be expected in the end.

The passage of a free-ship bill for foreign trade was not opposed at the last session, which indicates that the contention heretofore advanced that such a measure would be an entering wedge to break down the coasting-trade reservation has been abandoned.

The admission of foreign-built ships to the coastwise trade would be a reversal of our policy, which has been supported from the beginning of our Government by all parties as essential to the national defense. Our merchant ships and shipyards are as essential to the nation as our battleships, and a successful shipbuilding industry is as necessary to our independence now as it was in the early years of the Republic. Our shipyards should be maintained in great part by the orders of our citizens for merchant steamships, and the construction of large ocean steamers to be employed between our ports on both

oceans should secure to the United States a substantial increase in our shipbuilding industry.

SAFETY OF LIFE AT SEA.

In round numbers 2,000,000 persons annually now cross the ocean on their way to or from the United States. By far the greater part of these are American travelers or those seeking new homes and citizenship in this country. Our interest in the safety of ocean passenger travel, accordingly, is keener and more general than that of any other country in the world, not excluding Great Britain and Germany, which provide the greater number of ocean passenger steamers. The profound feeling aroused throughout the United States by the loss of the British steamship *Titanic* on April 15 did not find expression in radical legislation difficult or impossible to administer, but readily concurred in the sentiment of other nations in favor of an international conference for the consideration of means to prevent the recurrence of such disasters. The date of the conference has not been definitely fixed, but Congress has made ample provision for adequate American representation whenever the conference may be summoned. At the beginning of the last session, Congress addressed itself to the consideration of problems relating to the safety of ocean navigation, and had made good progress toward their solution before the *Titanic* disaster awakened the world to their urgency. The legislation of the last session concerning radio communication as the most comprehensive agency to promote safety of life has already been recognized in principle by maritime nations.

A revision of laws and regulations relating to lifeboats and life-saving appliances has been undertaken in this country and in others. The subject of laws governing the personnel of crews with a view to better guaranty of the fitness of men so employed, to which I invited attention in last year's report, is now being carefully inquired into here and abroad.

These subjects and the efficient water-tight subdivision of the hulls of ocean passenger steamships seem to me both the most important and the most difficult.

In legislation concerning safety of life at sea which it may be feasible to complete during the current session of Congress, it will be desirable, in my opinion, to follow the general principle that where the laws and regulations of a foreign country are as effective as the laws and regulations of the United States for the same purpose, such foreign laws and regulations should be recognized, subject always to the reservation that our officers shall have the right by actual examination to assure themselves that such laws and regulations are in fact complied with.

RADIO COMMUNICATION.

The first year's operation of the act to require apparatus and operators for radio communication on ocean steamers has confirmed the opinion expressed in this report last year that constant inspections are needed to give full effect to the law. The value of wireless telegraphy as an agency for the protection of life at sea has been conclusively demonstrated, and the United States in this respect has been more farsighted than other countries. The art, however, is relatively new and changes must be observed if the best results for the general good are to be secured. The apparatus in some of its parts is liable at any time to be impaired or deranged, and vigilance as well as skill and judgment are required on the part of the operators. The conditions, therefore, call especially for constant Government inspection.

During the past fiscal year, at a total cost of $6,959.01, the Department's three inspectors made 2,207 actual and careful inspections of apparatus on ocean passenger steamers. The inspections in some instances disclosed that ships were about to sail with apparatus inert and useless, and in many instances defects were discovered serious enough to bring the apparatus below the reasonable standard of efficiency prescribed by Congress. With the appropriation available and only three officers, regular inspections had to be confined to New York, San Francisco, and Baltimore, but passenger steamers at 19 other ports, from Boston to Galveston and from Port Townsend to San Pedro, were examined by the inspectors during short visits to ascertain conditions. At the last session Congress materially extended the act by requiring a constant watch through two operators, efficient communication between the ship's bridge and the radio room, and auxiliary apparatus to furnish power in case of accident disabling the ship's main power plant. Last July 1,207 ocean passenger steamships subject to the act sailed from 28 American seaports, and during the year the departures will doubtless exceed 12,000. After April 1, 1913, the act will apply also to the Great Lakes, and after July 1, 1913, to cargo steamers with crews of 50 or more. For the radio service Congress late in August appropriated for the current fiscal year $37,880, and the estimates for this service for the next fiscal year are $38,140. By purchasing inspecting instruments, which are somewhat expensive, and equipping in other respects the offices of the inspectors from current appropriations, the Department expects to be able to carry out the work for the next entire fiscal year at a cost little more than that for about 10 months of the current year and to make more thorough inspections.

The appropriations just referred to provide also for the enforcement of both the Berlin International Radiotelegraphic Convention

and the act to regulate radio communication, which were recommended in this report last year. On April 3, 1912, the Senate ratified the International Convention and on August 13 the act to regulate radio communication and to carry out the international obligations assumed was approved. The Berlin Convention provides an international system of certain and uniformly intelligible communication between ships at sea and between ships and shore stations by radiotelegraphy, which is the modern development of the old international code for transmitting messages at sea by flags and pennants.

The act of August 13 will take effect on December 13, and preparations for its administration have made satisfactory progress. The War Department and the Navy Department, which for several years past have joined with the Department of Commerce and Labor in recommending that the United States join the international system and make membership effective by legislation, are cooperating cordially in the preparations. The act requires Government licenses for the use of all transmitting apparatus for radio communication afloat or ashore within constitutional limitations.

This field of Federal activity is a new one; but in many respects it has been possible to follow precedents and established usages under the navigation laws. The United States, and Hawaii, Alaska, and Porto Rico, have been divided into nine districts. The inspectors were chosen after a special civil-service examination and have had excellent technical training, which has been supplemented by a brief course at the Bureau of Standards to adapt them for their special work. The number of stations subject to inspection can not be determined until later, but returns already received indicate several thousand stations. Maritime communication, of course, will receive the first attention. The coast radio stations almost without exception are owned and operated in all other countries by the government. Such coast stations are a necessary part of a system of maritime defense, and by using them also for commercial purposes other governments bring their stations to a high degree of efficiency. The act of August 13 provides that some of the naval stations, which protect our entire seacoast, shall be used for commercial purposes just as Congress some years ago authorized the commercial use of Army telegraph stations in Alaska. A year's actual operation of the composite system of Government and private stations under the act of August 13 will probably demonstrate whether in this country, as elsewhere, the best and most economical results can be obtained by an exclusive system of Government coast stations, devoted jointly to public and commercial purposes.

The appropriation for American representation at the International Radiotelegraphic Conference, recommended in last year's report, was made, and the delegates from the United States to the London Con-

ference in June were able to secure the assent of foreign powers represented to the principles which Congress has enacted into law. A special committee, representing British shipping interests, in July recommended wireless apparatus and a constant watch on ships carrying 50 or more persons including passengers and crew, and auxiliary apparatus to work at least four hours over at least 100 miles at sea. The conference revised the Berlin Radiotelegraphic Convention, but the act of August 13 is so framed as to require no considerable changes should the London Convention be ratified.

ENFORCEMENT OF NAVIGATION LAWS.

The navigation of rivers, harbors, and lakes is unquestionably attended with fewer fatalities from the operation of motor boats and other small craft and is much safer for vessels of all descriptions than it was several years ago. The number of violations of the navigation laws reported to the Department during the past fiscal year (3,634) is about one-third larger than during the previous year, but the increase is due to the greater vigilance of customs officers, and in fact indicates an improvement in the conditions of navigation on inland waters. The appropriation of $15,000 which Congress has now voted for each of two successive years has enabled the Department to effect this improvement. The purpose of the Department to require compliance upon the water with reasonable laws has been welcomed by prudent navigators, and in many localities the motor-boat associations and the newspapers have earnestly cooperated.

Of the $15,000 appropriated for last year, about $9,000 was expended for the hire of motor boats by collectors of customs to enforce the laws in 67 customs districts. From these districts 2,874 violations of law were reported. The law, of course, is not enforced as a revenue measure, but it is worth noting that the fines and penalties collected during the year amounted to $31,578.13, and several thousand dollars in penalties remain to be adjudicated. For $5,100 the Department purchased the motor boat *Tarragon*, for use principally on Chesapeake and Delaware Bays and their connecting waters. The boat was bought late in the year, but during its three months' service it inspected 700 vessels and covered 2,349 miles in 12 customs districts, and its work was generally commended in the localities where it was performed. For use on rivers, bays, and harbors, such a motor boat can perform much more work and do it more effectively and at very much less cost than a larger steam vessel. The results for two years with annual appropriations of $15,000 have led me to recommend for next year an appropriation of $25,000. The Department has under consideration the purchase of another small vessel for use on the Mississippi River from St. Louis to the Gulf and on the coast of Texas

in the winter, and on the Mississippi from St. Louis to the north and on the Ohio River to Pittsburgh in the summer, and the sum estimated for will provide funds for this purpose. There are no revenue cutters on these waters, and a small motor boat can be constantly employed to advantage.

NAVIGATION RECEIPTS.

The receipts from tonnage duties last year were $1,156,010.75, the largest amount since 1884, although rates were reduced by the tariff act of 1909. These duties are imposed without discrimination at rates lower than similar average rates in European ports, and are revenue taxes. Their collection occasionally raises questions of some intricacy, but usually collections are made promptly and at small cost. The rates are imposed on the cubical contents of a ship available for carrying cargo and passengers. Questions arise sometimes as to details of measurement, and to secure uniformity in administrative practice among measuring officers the Department has recommended a small appropriation of $3,500. This amount is desired for the salary and traveling expenses of a suitable person to inspect the work of measuring officers at different ports. The need for uniformity will be greater in a short time, when the same ships will frequently visit our ports on both oceans. The collections during the year of annual excise from foreign-built yachts owned by Americans amounted to $8,768.34. Since September 1, 1909, when section 37 of the current tariff act took effect, $68,126.37 has been collected from such yachts. Although the constitutionality of the excise has thus far been affirmed in the lower courts, yacht owners subject to it have delayed payments aggregating over $300,000 until the Supreme Court may render its decision in test cases, which probably will not be reached within a year.

MISCELLANEOUS.

The international convention for the unification of rules of law as regards assistance and salvage at sea, commended in last year's report, was ratified on January 18, and an act to give effect to its obligations was approved on August 1, 1912. The next international diplomatic conference for the unification of maritime law will be held at Brussels next spring. It will consider specifically the subject of the limitation of liability of shipowners, which since the *Titanic* disaster has become a matter of world-wide concern. The United States should be represented at this conference by men of ability and learning, and I trust that an appropriation of $5,000 to meet the traveling and other necessary expenses of a suitable American delegation may be allowed.

Shipping commissioners at 17 seaports shipped, reshipped, and discharged 374,783 seamen on American vessels during the past year, an increase of 7,760 men over the previous year. In ten years the number of men shipped, reshipped, and discharged has increased from 176,836 to 374,783, and the cost to the Government from $58,988.36 to $63,373.53. The opening of the Panama Canal will increase the extent of this service, and in time will probably necessitate the reestablishment of the office at Honolulu and require an additional deputy at each of several principal seaports.

The bill for the repeal of the law permitting imprisonment of seamen for desertion from American ships in remote foreign ports, recommended in this report for 1910 and 1911, has passed the Senate and favorable action by the House is hoped for. Nothing will be gained by postponing action on this measure until the question of terminating so much of our treaties and consular conventions as provides for the arrest of deserters from foreign ships in American ports has been settled. This change, I am convinced, will be made, but under the rules which govern diplomatic intercourse among nations months will be required to bring it about. I favor also improvements in forecastle accommodations for seamen, which have been suggested by the Commissioner of Navigation.

STEAMBOAT-INSPECTION SERVICE.

STATISTICAL SUMMARY OF WORK.

During the fiscal year ended June 30, 1912, there were transported on all vessels of United States registry which by law are required to report the number of passengers carried, 307,692,494 passengers. The total number of accidents resulting in the loss of life during this period was 39, a decrease from the previous year of 9, and the number of lives lost 264, including passengers and crew, a decrease from the previous year of 128. Of the total number of lives lost, 183 were from suicide, accidental drowning, and other causes not incident to the perils of navigation, which leaves 81 which can fairly be chargeable to such perils. The total number of 264 lives lost, when compared with the number of passengers that were carried, makes a ratio of 1 life lost, including passengers and crew, for every 1,165,501 passengers carried.

The number of vessels inspected and certificated in the fiscal year 1912 was 7,836, with a tonnage of 8,755,280, a decrease of 499 in number, with an increased tonnage of 260,294, as compared with the previous fiscal year. Of the vessels certificated 6,432 were domestic steamers with a tonnage of 4,872,532, a decrease of 567 in number, with an increased tonnage of 169,014; and 438 were foreign passenger

steamers with a tonnage of 3,384,905, a decrease of 30 in number, with an increased tonnage of 54,638. Sail vessels and barges to the number of 38 were inspected, with a tonnage of 18,755, an increase of 2 in number and of 194 tons, and also 502 seagoing barges of 458,245 tons were inspected, an increase of 27 in number and of 33,416 tons over the previous year. Four hundred and twenty-six motor vessels with a tonnage of 20,843 were inspected and certificated, an increase of 69 in number and 3,032 tons over the previous year.

Licenses were issued during the year to 28,036 officers of all grades, an increase of 14,030 over the preceding year. There were 7,616 applicants examined for color blindness, of whom 206 were rejected and 7,410 were passed. As compared with the previous year, these figures show an increase of 6,299 in the number examined and 6,123 in the number passed.

At the various mills 3,786 steel plates for the construction of marine boilers were inspected, a decrease from the previous year of 130, and of this number 263 were rejected. In addition to these plates, there were inspected at the mills a large number of steel bars for braces and stay bolts for marine boilers, and also several hundred plates for stock and repair purposes. Many requests were received from other branches and departments of the Government for the testing of boiler material at the mills. These received the attention of the Service, and prompt reports were rendered to the proper officials.

During the year there were examined and tested at various manufactories 244,565 life preservers, of which 2,750 were rejected.

The total number of persons in the Service at the end of the fiscal year ended June 30, 1912, was 263, consisting of 186 officers, 76 clerks, and 1 messenger. One vacancy existed in the Service on that date.

CLASSIFICATION FOR HULL INSPECTION.

It becomes more apparent each year that there should be some classification for hull inspection, and there is no reason why there should not be an American standard of construction. At the present time the American Bureau of Shipping, closely allied with and supported by shipowners, shipbuilders, and marine insurers, is the only standard that we have in this country. The Board of Supervising Inspectors is the body that should formulate the rules for this American standard, preliminary to which it should examine the rules of the American Bureau of Shipping and make such changes as seem desirable, and it should also suggest some basis of cooperation with that Bureau. It is believed that under sections 4405 and 4417, Revised Statutes, the Board has the authority to undertake this work, and the Department has under consideration the assignment to it of this duty.

TRANSPORTATION OF DANGEROUS ARTICLES.

The Service is given a certain control over the transportation of dangerous articles on steamers carrying passengers; but the provisions of section 4472, Revised Statutes, are imperfect, and there are still some dangerous conditions that the Service is powerless to correct. Therefore, section 4472 should be so amended as to give the Service authority to formulate for the transportation of dangerous articles regulations similar to those of the Interstate Commerce Commission for railroads. In the formulation of such regulations valuable suggestions and data may be furnished by the Bureau of Standards, the Bureau for the Safe Transportation of Explosives and other Dangerous Articles, of New York City, and the Interstate Commerce Commission.

In the same connection may be considered the dangers which arise from the transportation of automobiles. The statute places the responsibility for the enforcement of the law relating to the transportation of automobiles upon vessel owners, but correspondence on file in the Bureau shows the difficulty that has been experienced by inspectors and by ferry companies. The statute provides that all fire in such vehicles be extinguished immediately after entering upon such vessel, but it is obvious that the owner of the vessel is not in a position to enforce this provision, and that any attempt on his part to do so would result in disorder and probably in damage. A large number of these vehicles are carried on passenger steamers, and in spite of every care there is constant danger of a great conflagration that will result in the loss of many lives.

INSPECTION OF MOTOR VESSELS.

The Bureau has on previous occasions stated that motor boats should be subject to its inspection. Could motor boats be inspected and certificates of inspection be issued to them, operators of such vessels would know exactly how to equip them; and it is believed that the owners themselves, could inspection once be had, would support the efforts of the Service for safer conditions on these boats.

UNIFORM ADMINISTRATION OF LAW.

Section 4403, Revised Statutes, requires that the Supervising Inspector General shall produce a correct and uniform administration of the inspection laws, rules, and regulations, and he has made constant effort, more especially by working through the ten supervising inspectors, to comply with that requirement. The supervising inspectors are constantly kept informed of the policy of the Bureau, and they in turn keep the local inspectors informed. The ten supervising inspectors meet as a board in January of each year. At these

board meetings matters that have occurred in the several districts are brought up, and from the discussion that follows the proper rules are decided upon.

For nearly three years now the Bureau has followed the custom of issuing monthly bulletins that contain rulings of interest to the merchant marine and to the inspectors of the Service. These bulletins are distributed for the guidance of the inspectors, and, further, to keep the merchant marine informed as to the rulings. The purpose, of course, is not so much to apprehend those who violate the law as to prevent the violation, and this the bulletins of the Service assist in accomplishing.

The last, but by no means the least, effective method of securing uniform administration of law is the license and vessel card system that is in effect in the Service. By means of these cards, which are received every day, the central office is able to detect at once errors that are being made in the districts, instead of waiting as heretofore for the end of a quarter, or for the end of the year, at which time the reports formerly submitted were so large as to render it impossible to detect and to correct errors that had been committed throughout the year.

OVERLOADING OF PASSENGER STEAMERS.

The number of persons permitted to be carried on passenger steamers presents a question that has received the careful and constant attention of the Bureau.

Section 4464, Revised Statutes, requires inspectors to state in every certificate of inspection granted to steamers carrying passengers, other than ferryboats, the number of passengers for which any such steamer has accommodations. This provision is probably wise; local conditions vary and the local inspectors are presumably best informed as to the number of passengers a steamer can carry with safety. The Bureau endeavors, however, to impress upon the local inspectors that the responsibility is theirs, and that the constant temptation to overcrowd constitutes an increasing danger to life against which the vigilance of the inspectors alone can protect the public.

It is believed that the new rules governing life-saving equipment will materially aid the inspectors in the performance of this duty. The requirements of the new rules vary greatly according to ocean, coastwise, lake, or river service; also according to season and other conditions which go to determine risk. But throughout the equipment is predicated upon the number of passengers and not, as was the case before, upon tonnage, so that the inspectors now have at least one positive restriction against overcrowding to rely upon and to enforce.

TRAVELING EXPENSES.

If inspectors were placed upon actual expenses when traveling, and not upon mileage, a large saving in travel expense would undoubtedly result, and it is recommended that such a change in practice be given the sanction of law.

CONCLUSION.

This year I have given a very extensive account of the Department's work in the hope that some impression of the extent of that work may be given. For more complete discussions I must refer to the reports of the several bureaus.

Respectfully,

CHARLES NAGEL,
Secretary.

REPORT

OF THE

POSTMASTER GENERAL.

DECEMBER 1, 1912.

TO THE PRESIDENT:

I have the honor to present the annual report of the Postmaster General for the fiscal year ended June 30, 1912.

POSTAL FINANCES.

In 1911, for the first time since 1883, postal receipts exceeded postal expenditures, leaving a surplus instead of a deficit. A heavy loss of revenue in 1912, due to the extraordinary amount of franked matter mailed in the political primaries, created a temporary deficit, but since the close of the fiscal year the income of the department has again outstripped expenses.

The year preceding the present administration was marked by the largest postal deficit on record, amounting to seventeen and a half million dollars. During the next two years the deficit was greatly reduced and later eliminated. When compared with the financial showing of four years ago the reports of income and expense for subsequent years indicate an aggregate saving of about $45,000,000.

EXTENSION OF THE SERVICE.

The transformation of a deficit into a surplus has been accomplished not by curtailing the service, but by developing it along profitable lines. Although postal facilities have been greatly enlarged, extensions have not been made in a haphazard manner, but only when shown on investigation to be justified by conditions.

Since the opening of the present administration 4,765 new post offices have been established, delivery by carrier has been provided in 280 additional cities, and 3,043 new rural routes, aggregating 73,191 miles, have been authorized.

To insure a prompt and accurate handling of the mails throughout the extended service the force of postal employees has been increased

by more than 12,000. Liberal compensation has been provided for these employees and a higher standard of efficiency thus encouraged. The amount expended for salaries last year was approximately $23,000,000 greater than four years ago. The average annual compensation has been increased in this period from $979 to $1,093 for post office clerks, from $1,021 to $1,092 for city letter carriers, from $1,168 to $1,262 for railway postal clerks, and from $869 to $1,062 for rural carriers.

Large expenditures have been required in order to extend postal facilities in the manner described and to provide the additional compensation for employees, but it is believed that the amounts expended in each case were fully justified, particularly in view of the fact that meanwhile the service has been so conducted as to be self-supporting.

POSTAL SAVINGS SYSTEM.

The work of establishing postal savings depositories at presidential post offices was completed early in the last fiscal year, and since then the system has been extended to include 4,004 fourth class post offices, as well as 645 branch offices and stations in the larger cities. There are now 12,812 depositories at which patrons of the system may open accounts. The number of depositors has increased to about 300,000 and the amount of their deposits to approximately $28,000,000, not including $1,314,140, which is the sum withdrawn by depositors for the purpose of buying postal savings bonds. The bonds have been rendered particularly attractive by the announcement that the board of trustees will purchase them at their face value whenever the holders desire to convert them into cash.

Experience gained in the operation of the system has shown the wisdom of using the certificate of deposit instead of a pass book. The use of the certificate has reduced to a minimum the cost of administration, avoiding the necessity of keeping at the central office a ledger account with each depositor. In foreign countries, where the pass book is invariably used, thousands of clerks are required at the central offices to keep the accounts, whereas under the certificate plan adopted in the United States a much smaller number of employees can readily do all the necessary bookkeeping.

The postal savings funds deposited at each post office are required by the law to be redeposited in local banks. State and National banks to the number of 7,357 have qualified as depositories for these funds. The deposits in such banks are secured by bonds aggregating $54,000,000. Of this amount, $37,000,000 represents municipal bonds, the marketability of which has been greatly increased by the establishment of the Postal Savings System.

On the basis of the present monthly net increase of deposits it is estimated that the gross income of the Postal Savings System for the fiscal year ending June 30, 1913, will amount to $700,000 and the interest payable to depositors to $300,000. The cost of supplies and equipment and the salaries of clerks at the central office during this period will aggregate about $425,000, and to this amount should be added approximately $275,000, representing compensation for the time of post office clerks employed on postal savings work. Thus it will be seen that the estimated income of the system for the fiscal year will meet the amount of interest payable as well as the total expenses of the central office, but will not be large enough to cover also the cost of the clerical work in post offices. It is expected that when the deposits have increased to $50,000,000, which at the present rate they will soon do, the system will be self-sustaining.

The existing law prohibits the acceptance of more than $100 in any calendar month from the same depositor and provides that the balance to his credit shall never be allowed to exceed $500 exclusive of accumulated interest. Sufficient time has already elapsed to show that the amount of money that the Postal Savings System causes to be withdrawn from banks is very small and that a large part of the deposits of the system represents hoarded money that is restored to the channels of trade. A still more valuable service in this respect would be rendered were it not for present restrictions that have necessitated the refusal of deposits aggregating millions. If the law were so amended as to remove the limitation on deposits with the proviso that no interest should be paid on any sum in excess of $1,000 deposited by a single depositor there would be no incentive for the transfer of money from savings banks and many persons who do not patronize such banks would doubtless entrust their funds to the Postal Savings System.[1]

PARCEL POST.

The parcel post system will go into operation on January 1. As the desired legislation was not enacted by Congress until late in August the period allowed in which to organize a service so extensive was exceedingly brief and required energetic measures. The department immediately took up the work of formulating plans for the establishment of the system and the necessary arrangements are nearing completion. When it is understood that the parcel post provided for in the law will reach every city and town now served by the express companies and also, through the smaller post offices and the rural delivery service, more than 20,000,000 people who at present have no such facilities, its great extent can be appreciated. It

[1] Legislation to this end is suggested on p. 1669.

will be the only time in the history of the department that a new service extending throughout the entire country is put into immediate operation as a whole without first giving it trial on a limited scale. Since the passage of the act the officers of the postal service have given their untiring efforts to the work of organizing the new system, and it is confidently expected that on the date appointed it will be in readiness to meet successfully the requirements of the public.

Although the postage rates for the new parcel post system range considerably lower than corresponding express charges, it is believed that experience will show them to be higher in some instances than is necessary in order to maintain the service at cost. Likewise, the restriction that places an 11 pound limit on the weight of parcels mailed should be regarded as merely tentative. After the system is thoroughly organized on that basis the scope of the service in its usefulness to the public should be still further enlarged by increasing the weight limit. If properly developed under efficient management the parcel post will prove to be a most important factor in reducing the cost of living.

CONSOLIDATION OF THE THIRD AND FOURTH CLASSES OF MAIL.

Owing to the graduated zone rate applicable to fourth class mail under the new parcel post law and the unchanged flat rate on third class mail, postage charges for these two classes of mail bear no fixed ratio to each other. For certain weights and zones the parcel post rates are lower than the third class rates, while in other cases they are higher. This condition is likely to result in much confusion and should not exist. Packages containing books or catalogues do not differ in any essential particular from other parcels and they should be handled by parcel post. Prior to the enactment of the parcel post law the department urged that these two classes of mail be consolidated, and the recommendation for such action is now renewed.[1]

READJUSTMENT OF POSTAGE RATES.

In the last three annual reports attention was directed to the great loss in handling and transporting second class mail at the present low postage rate of 1 cent a pound. The interest in this question aroused by the department's recommendations for a higher rate finally resulted in the joint resolution passed by Congress on March 4, 1911, authorizing the appointment of a commission to investigate the subject and make report. The President selected as members of the commission Mr. Justice Hughes, of the Supreme Court; President Lowell, of Harvard University; and Mr. Harry A. Wheeler, of Chicago. After granting extensive hearings the commission pre-

[1] See p. 1667 for tentative draft of legislation to accomplish this purpose.

pared an exhaustive report and submitted it to the President on February 2, 1912. Without taking into account certain items of cost, regarding which exact information was not obtainable, the commission found that the cost of handling and transporting second-class mail was approximately 6 cents a pound. The department's recommendation that as a step toward the proper adjustment of postage charges the rate be increased from 1 cent to 2 cents a pound on all second class publications, except those mailed for delivery in the county of publication, was approved by the commission. On February 22, 1912, the report was transmitted to Congress by the President, who urged favorable consideration. Thus far Congress has not acted on the report, but it is hoped that the matter will receive early attention. The enactment of legislation raising the rate to 2 cents a pound would be an important step toward a general equalization of postage charges.

There is a widespread popular interest in the plan to lower the postage charge on letters from 2 cents to 1 cent an ounce. If the rate of postage on second class mail were sufficiently increased to cover the cost of handling and transporting such mail it would pave the way for this change, making it possible to reduce the first class rate without abandoning the present policy of a self-supporting postal service.

FRANKING PRIVILEGE.

During the fiscal year 1912 more than 300,000,000 pieces of mail, having an aggregate weight of about 61,000,000 pounds, were carried by the postal service free of charge under the franks of Congressmen and of the various Government establishments. If postage at the usual rates had been paid on this matter, the postal revenues would have been increased by more than $20,000,000, a sum that is several times greater than the expense incurred on account of the postal service by other departments of the Government, such as the free quartering of certain post offices in Federal buildings. It is manifestly unfair to give the Post Office Department no credit in the Government's fiscal accounts for an item of expense so tremendous as that resulting from the present extensive use of the franking privilege. If the responsibility for the expenditure could be properly distributed, it would doubtless do away with much abuse of the privilege and accordingly effect important savings to the Government. The department therefore renews its recommendation that the practice of franking be discontinued and that legislative authority be granted for the use on official mail of special stamps to be furnished by the Post Office Department on the requisition of those entitled to them.[1]

[1] See p. 1667 for suggested legislation relating to the franking privilege.

SHIPMENT OF PERIODICALS BY FREIGHT.

Although confined in its operation to one of the four contract sections of the country, the plan of shipping monthly, semimonthly, and biweekly periodicals in fast freight trains, which was proposed in the last annual report as a measure for reducing the great loss sustained in transporting second class mail, resulted in a saving during the year of more than a million dollars. After the close of the fiscal year this method of transporting periodicals was successfully extended to another contract section, but for the present the plan can not be adopted in the remaining two sections, as Congress on August 24, 1912, prohibited the further application of the policy. The prohibition is to be regretted, for it has been clearly shown by the experience already gained that aside from the important saving effected the withdrawal from the regular mail trains of the vast quantities of periodical matter greatly facilitates the handling of first class mail.

COMPENSATION TO RAILWAYS FOR CARRYING THE MAILS.

It is expected that the establishment of the parcel post will largely increase the amount of mail to be transported by the railways, and action should be promptly taken that will provide for them the additional compensation to which they are entitled. Over a year ago the department formally submitted to Congress a plan for a complete readjustment of the system of paying railways for mail transportation. Under this plan, which substitutes space for weight as the principal factor in fixing compensation, it will be possible to determine without delay what additional payment should be made on account of the parcel post. The department's recommendation is based on the results of a far-reaching investigation begun early in the administration with the object of determining what it costs the railways to carry the mails. The statistics obtained during the course of the inquiry showed that while many of the railways, particularly the larger systems, were making considerable profits from mail transportation, certain of the lines were actually carrying the mails at a loss. As a result of its investigation, the department decided to urge the abandonment of the present plan of fixing compensation on the basis of the weight of the mails carried, a plan that has proved to be exceedingly expensive and in other respects unsatisfactory. Under the new method proposed the railway companies will annually submit to the department a report showing what it costs them to carry the mails, and this cost will be apportioned on the basis of the car space engaged, payment to be allowed at the rate thus determined in amounts that will cover the cost and a reasonable profit. If a railway is not satisfied with the manner in which the cost is apportioned in fixing compensation, it is to have the right of appealing to the Interstate Commerce Com-

mission. This feature of the new plan would seem to insure a fair treatment of the railways. It is hoped that Congress will give the matter prompt attention and that the method of compensation recommended by the department will be authorized.[1]

REORGANIZATION OF THE RAILWAY MAIL SERVICE.

In the last annual report plans were described for the reorganization of the Railway Mail Service. These plans have been since put into effect with great benefit to the service and its employees.

The legislation the department recommended for the reclassification of the employees was enacted by Congress, and under its provision nearly 12,000 railway mail clerks have been granted better compensation. Hereafter all employees that render faithful and efficient service will receive annual promotions until they reach the maximum salary, which is considerably higher than in the past. The new legislation has extended to railway mail clerks the same system of salaries and promotions as that recently applied so successfully in the case of post office clerks and letter carriers. Previously a railway mail clerk could be promoted only when a vacancy occurred in the grade above him. Now he can count on promotions at stated intervals, provided he performs his duties faithfully and well. The adoption of the new salary system has already done much to raise the standard of efficiency.

The reorganization of the Railway Mail Service in other respects is practically completed. Chief clerks are now required to make frequent inspections of their lines and to see that proper conditions, including car sanitation, are constantly maintained. The substitution of all-steel and steel-underframe cars for cars of wooden construction is being continued, as is also the general standardization of car equipment.

VILLAGE DELIVERY SERVICE.

In accordance with the department's recommendation of a year ago Congress enacted legislation authorizing the establishment of an experimental mail delivery service in towns and villages having second and third class post offices from which such delivery could not be made under prior laws. An appropriation of $100,000 was provided to defray the expenses of the new service, the amount to be expended during the year at any one office being limited to $1,800. Investigations were promptly made to determine at what offices the experimental service could be established with greatest advantage, and thereupon the department selected for the purpose a series of offices distributed as widely as possible throughout the country. It is believed that the result of the experiment will be such as to justify the permanency of the proposed service.

[1] A suggested draft of the legislation desired appears on p. 1674.

RURAL MAIL SERVICE.

Since the consolidation two years ago of the rural delivery and star route systems there has been no halt in the rapid extension of the rural mail service. During the fiscal year 1912 the department put into operation 570 additional rural routes aggregating 13,691 miles in length. As rapidly as conditions will permit this branch of the service is being still further developed. Since the beginning of the current year orders have been issued for the establishment of 388 new routes. With the introduction of a parcel post on January 1 the rural mail service will prove to be of still greater benefit to the vast number of people it reaches, and even larger appropriations than at present will be justified for its maintenance and extension.

The more liberal salaries recently granted to rural carriers under Congressional authority have had a beneficial effect. In view of the larger volume of mail these employees will be required to handle with the introduction of the parcel post their increased compensation is timely.

OCEAN MAIL SERVICE.

As a means of promoting commerce the department recently entered into a contract with the Oceanic Steamship Company under the act of 1891 for service for a period of 10 years, beginning July 1, 1912, in vessels of the second class, from San Francisco to Sydney, Australia, via Honolulu and Pago Pago. This contract reestablishes on the Pacific a regular mail service under the American Flag.

The department also readvertised for service to the Isthmus of Panama under the provisions of the act of 1891, but unfortunately no bid was received. Contracts for service to Mexican ports via Havana and to Venezuela, which expired during the year, have been renewed for a term of 10 years.

The impracticability of obtaining mail service in 16-knot vessels under the terms of the act of 1891 on the long routes to South America and the Far East has been discussed in preceding reports. Most of our mails for trans-Pacific destinations and all of our mails for South American ports south of Venezuela are still carried in foreign steamers, the movements of which are entirely beyond the control of the department.

Legislation should be enacted that will enable the department to pay for ocean mail service in 16-knot vessels of the second class on routes 4,000 miles or more in length at a rate not exceeding $4 a mile of each outward voyage, this being the rate applicable under the act of 1891 to 20-knot vessels of the first class.[1]

[1] A tentative draft embodying the legislation desired by the department appears on p. 1674.

AEROPLANE MAIL SERVICE.

Since the first dispatch of United States mail by aeroplane, which occurred in September, 1911, the department has authorized about 50 temporary routes, and for brief periods considerable quantities of mail have been carried in this manner. Decided improvements were made during the year in the construction of aeroplanes, and there is reason to believe that in due course they will be so far perfected as to render them an important agency in the transportation of mail.

POSTAL TELEGRAPH SERVICE.

In the last annual report the opinion was expressed that the telegraph lines in the United States should be made a part of the postal system and operated in conjunction with the mail service. It is believed that under proper management such a consolidation would result in important economies and thus permit the adoption of lower telegraph rates. Now that a Postal Savings System has been established and a parcel post provided for, there would seem to be no better opportunity for the profitable extension of our postal business than through the adoption of a Government telegraph system.

ANNUAL VACATIONS.

The department renews its recommendation for legislation authorizing the allowance of 30 days' annual leave of absence with pay to post office clerks, city letter carriers, and such railway postal clerks as are required to work six hours a day throughout the year.[1] The proposed legislation would place the employees in the postal service at large on the same basis with respect to vacations as those engaged in the departmental service at Washington. Although the granting of longer vacations would entail considerable expense on the Government, it is believed that it would so far raise the standard of efficiency as to justify the expenditure.

SUNDAY SERVICE.

In order to afford the officers and employees of the postal service as much relief as possible from Sunday service the department over a year ago put into effect an order cutting down materially the amount of work to be performed on that day by post office clerks and letter carriers. Such employees as it was necessary to keep at work in order to make a distribution of important mail were granted compensatory time on other days of the week equal to the period of Sunday employment. This plan, which the employees naturally

[1] See p. 1671 for draft of proposed legislation.

regarded with great favor, was put into effect in such manner as to cause little inconvenience to the patrons of the service.

Without recommendation from the department Congress inserted in the act making appropriation for the postal service during the current fiscal year a paragraph providing that post offices of the first and second classes should not be open on Sundays for the purpose of delivering mail to the general public. This provision of law went into effect on August 24, 1912. The department construed the provision broadly, assuming that it was not the intention of Congress to require a complete stoppage of the mails on Sunday. Transit mail must be forwarded on that day as usual, for to interrupt its movement would cause a serious clogging of the entire system of mail transportation. The department therefore continues to make provision for the prompt forwarding of transit mail on Sunday, but the work of sorting mail on that day for local delivery has been reduced as far as practicable, being limited to mail that is peculiarly transient in character or that loses its value if not promptly received. Thus mail intended for guests at hotels, and for hospitals, clubs, and the like, can be obtained at the post office on Sunday, and also mail for newspaper offices and newsdealers. Up to midnight on Saturday incoming mail addressed to lock boxes is sorted so as to be available to box holders on Sunday. In emergency cases important letters from a known source are sorted out on Sunday when specially applied for by people who wish them that day. Mail bearing special delivery stamps continues to be delivered on Sunday.

PENSIONS FOR SUPERANNUATED EMPLOYEES.

Civil pensions based on length of service should be granted to postal employees when they become superannuated. It is likely that the expense of such a system would be more than offset by gains in efficiency. Although the compensation of postal employees has been considerably increased during the last few years, it is still insufficient to permit adequate savings against old age. Foreign nations pension their aged employees, as do also many corporations, and on business grounds, if for no other reason, the Government should do likewise.

SALARIES OF SUPERVISORY OFFICERS.

The inadequacy of the salaries paid to many supervisory officers at first class post offices has been commented on in preceding annual reports. As a result of the department's recommendation legislation was enacted providing promotions for 1,016 such employees in the fiscal year 1912 and for 1,003 in the current fiscal year. It is hoped that the department's estimate for 2,075 similar promotions in the fiscal year 1914 will be acted on favorably during the coming session of Congress.

CLASSIFICATION OF POSTMASTERS.

The strict observance for several years of the policy of retaining in office fourth class postmasters who were rendering efficient service paved the way for the partial classification of such postmasters in 1908. At that time the postmasters of the fourth class in the 14 States lying east of the Mississippi River and north of the Ohio River, numbering altogether about 15,000, were placed in the classified service by Executive order. Under date of October 15 last President Taft, on the recommendation of the Post Office Department, issued an order classifying all the remaining fourth class postmasters in the United States, with the exception of those in Alaska, Guam, Hawaii, Porto Rico, and Samoa. Over 36,000 postmasters were affected. By the terms of the order fourth class post offices were divided into two groups, A and B. Group A embraces all post offices at which the compensation of postmasters is $500 or more, and group B includes all offices at which the compensation is less than $500. Appointments at offices in group A are made by selecting one of three names certified by the Civil Service Commission after competitive examination, this being the method of appointment now followed in all other branches of the classified service. Appointments at offices in group B are made on the recommendation of post office inspectors, with the approval of the Civil Service Commission, after personal investigation by the inspectors.

As the fourth class postmasters of the country number over 50,000, they now constitute one of the largest branches of the classified service. Their classification, following that of assistant postmasters, was an important step in the plan of divorcing the postal service from politics. For the fulfillment of this plan it only remains to classify the 8,000 presidential postmasters, as already recommended. It is impossible to conduct the service with the fullest measure of efficiency so long as the postmasters, who have charge of its local management, are subject to political control.

CRUSADE AGAINST FRAUDULENT USE OF THE MAILS.

In continuation of its policy of prosecuting persons who make illegal use of the mails, instead of merely issuing fraud orders against them, the department investigated during the last fiscal year more than 4,000 cases involving schemes to defraud. These investigations and the resulting prosecutions and convictions have had the effect of stamping out for the time being most of the swindling done through the mails. In the last two years over a thousand persons have been arrested by post office inspectors for such swindling, and it is estimated that the losses to the public through their fraudulent operations amounted to over a hundred million dollars.

It was suggested in the last annual report that the work of investigating frauds committed through the mails should be transferred to the Department of Justice, thus enabling the department charged with the prosecution of such cases to procure through its own agencies the required evidence and at the same time relieving post office inspectors of a responsibility that now interferes seriously with the performance of their postal duties.[1]

FEDERAL AID IN ROAD IMPROVEMENT.

In the act making appropriations for the postal service during the current fiscal year Congress inserted an item of $500,000 to be expended under the joint direction of the Secretary of Agriculture and the Postmaster General in improving the condition of roads over which mail is delivered by rural carriers. The law provides that the State or the local subdivision in which the work of road improvement is undertaken shall furnish double the amount of money allotted by the Government. Under a plan agreed on by the two officers mentioned it was decided to expend the appropriation as far as practicable in equal amounts in the several States. The governors of the States have been requested to designate the roads to be improved and to arrange for the raising of the funds required under the law to supplement the amount provided by the Federal Government. As the amount to be allotted in each instance has been fixed at $10,000, it is necessary for a State to raise $20,000 before the work of road improvement can be undertaken. Most of the States are not yet prepared to comply with this requirement and consequently it has not been an easy matter to carry out the purpose of the law.

IMPROVEMENTS IN THE POSTAL SERVICE.

To indicate the improvement made in the postal service during the present administration 50 of the more notable accomplishments are here enumerated, as follows:

(1) The elimination of a deficit of seventeen and a half million dollars, thereby placing the postal service on a self-supporting basis for the first time since 1883.

(2) The establishment on January 1, 1911, and the successful operation of the Postal Savings System.

(3) The preliminary organization of the parcel post system that will go into operation on January 1, 1913.

(4) A thorough revision of the accounting methods of the department and the adoption of a system of accounts under which it is possible to determine without delay the financial condition of the service.

[1] This recommendation is renewed on p. 30 of this report.

(5) An effective crusade against the use of the mails for advertising and promoting fraudulent investment schemes and medical malpractice.

(6) A consistent enforcement of the policy of reappointing presidential postmasters who show themselves to be competent and faithful officers, thus retaining the management of the service in experienced hands.

(7) The completion of an inquiry into the cost of handling and transporting mail of the several classes and of conducting the money order, registry, and special delivery services, the results of which inquiry have been reported to Congress.

(8) The completion of an inquiry into the cost to the railways of carrying the mails and the submission to Congress of a report recommending a new method of fixing rates of pay for railway mail transportation as determined on the basis of space instead of weight.

(9) The establishment of an experimental system of free delivery in villages, which it is proposed to extend to all towns and villages having second or third class post offices that are not now entitled to free delivery service.

(10) The reorganization of the Railway Mail Service and the reclassification of railway postal clerks on a higher salary basis.

(11) The consolidation under the Division of Rural Mails of the Rural Delivery and Star Route Services, thus preventing much duplication of service.

(12) The consolidation under the Chief Inspector of the several groups of field agents of the department, thereby insuring better supervision and greater economy of time and travel.

(13) The organization throughout the country of State associations of postmasters and postal employees formed for the purpose of holding periodical meetings to discuss plans for the betterment of the service.

(14) The civil service classification of all fourth class postmasters not hitherto classified, except those in Alaska, Guam, Hawaii, Porto Rico, and Samoa.

(15) The extension of the classified civil service to assistant postmasters and hitherto unclassified clerks in post offices of the first and second classes.

(16) The amendment of the civil service regulations on the department's recommendation so as to provide for the certification of three names instead of one for appointment to the position of rural carrier, and to provide also that rural carriers shall be eligible for transfer to other positions in the classified service.

(17) The adoption for disciplinary purposes in the rural mail service of temporary reductions in pay instead of suspensions from duty, thus avoiding enforced idleness on the part of employees.

(18) The adoption of the policy of accepting surety instead of personal bonds for postmasters, thus relieving postmasters of the necessity of placing themselves under embarrassing obligations by asking individuals to qualify as their bondsmen.

(19) The reorganization of the working forces in city post offices by consolidating under one superintendent the divisions that have to do with the handling of the mails and under another superintendent the divisions that have charge of financial matters, thus permitting a more effective utilization of the time of the employees.

(20) The introduction of the plan of having the routes of carriers on vacation served by the carriers on adjoining routes, thus rendering unnecessary in many cases the employment of substitutes.

(21) A reduction in the number of substitute letter carriers appointed at city offices, so as to render this line of employment more attractive because of the shorter period during which substitutes are obliged to wait for regular appointments.

(22) The adoption and successful employment of a uniform system of efficiency records as a basis for the compensation of post office clerks and city letter carriers.

(23) The granting to postal employees of one day's rest a week by giving them compensatory leave of absence for Sunday service whenever such service is necessary.

(24) The adoption of positive measures to improve the sanitation and lighting of post offices, thus protecting the health and increasing the efficiency of employees.

(25) The transportation of certain magazines and other periodical mail of the second class by fast freight instead of in the regular mail trains, thus saving a large sum to the Government.

(26) The shipment of vast quantities of postal supplies by freight instead of by mail, thus saving to the Government the difference between mail and freight charges.

(27) The adoption in large cities of the plan of locating the principal post office building at the main railway station, in order to secure a more expeditious handling of the incoming and outgoing mails.

(28) The extensive utilization of automobiles in place of horse-drawn vehicles in the city postal service, thus greatly expediting the movement of the mails.

(29) The adoption of the policy of requiring suitable receptacles for mail to be provided at the entrances of residences and offices as one of the conditions for the extension of city delivery service by carrier.

(30) The standardization of all furniture and fixtures for post offices, thus securing a uniform equipment that experience has shown to be best adapted to the work.

(31) The adoption and utilization in post offices of various labor-saving appliances to secure a more expeditious handling of the mails.

(32) The adoption of standard specifications for the construction and arrangement of interior fixtures for railway post office cars.

(33) The adoption of new designs for postage stamps to avoid the confusion resulting from the similarity in appearance of certain denominations.

(34) A marked improvement in the quality of the postal cards manufactured for sale by the Government through the substitution of a high-grade paper for the unsatisfactory stock previously used.

(35) The adoption of new forms of domestic and international money orders that have greatly simplified the work in post offices and facilitated the auditing of accounts.

(36) The discontinuance of the requirement that the postmaster issuing a money order shall mail a notice or "advice" thereof to the postmaster on whom it is drawn, a practice begun many years ago before the money order system was perfected, and the abolishment of which not only expedites the handling of the money order business but greatly reduces its expenses.

(37) The omission of the post card acknowledgment of the receipt of a registered article, unless requested by the sender, thereby saving in a large number of cases its cost and the time required to prepare it.

(38) The amendment of the postal regulations so as to permit the delivery of registered mail to any member of the addressee's family, or to any of his clerical employees, instead of only to the addressee or on his written order, and to permit also its being forwarded on the written order of any person authorized to receive it, instead of on the written order only of the addressee, thus removing a source of irritation to the public and relieving the department of the expense of repeated attempts at delivery.

(39) The rapid substitution of all-steel and steel-underframe cars for wooden cars in the Railway Mail Service and the enforcement of more rigid requirements as regards the sanitary condition of the cars, thus further safeguarding the lives and health of railway mail clerks.

(40) The establishment of a comprehensive system under which publishers sort their second class mail by routes, cities, and States before delivering it for mailing, thus reducing to a large extent the cost to the Government of handling such mail.

(41) The adoption of a lighter canvas sack, weighing only 1 pound, for the use of publishers and others who make up second, third, and fourth class mail for dispatch directly to destination, effecting an important saving in weight and at the same time greatly facilitating the handling of such mail.

(42) The shipment of supplies from the contractor directly to post offices, when it can be advantageously done, instead of having them forwarded to the Division of Supplies at Washington for reshipment, thereby saving transportation and drayage charges as well as expenditures for labor and for storage space.

(43) The discontinuance of the manufacture of special registry transportation equipment and the authorization of the use for registered mail of the much lighter and less expensive ordinary equipment, thereby reducing the cost of manufacture and of transportation.

(44) The abolishment of the special envelopes formerly used for inclosing registered articles while in transit, thereby effecting a saving of the cost of such envelopes and of the time consumed in sealing, addressing, and removing them.

(45) The adoption of a new form of contract for the transportation of mail by wagon and automobile in cities under which compensation is placed on a mileage basis and regulated in accordance with the amount of service performed.

(46) The adoption of a four-year term in making contracts for conveyances to be used in the city delivery service and for canceling machines, thus rendering it possible to secure much lower charges than those required under a one-year term.

(47) The concentration of the money order accounting work of city postal systems in the main offices, where it can be done more satisfactorily than at the branches and stations.

(48) An improvement in the system of keeping the stamp accounts with post offices whereby the department is enabled to keep a complete record of stamp sales and stock on hand at each post office, showing at any time the income from this source, which constitutes 92 per cent of the postal revenues.

(49) A revision of the printed forms used in the postal service and the reduction of the larger forms to a size suitable for typewriting on standard machines.

(50) A treaty arrangement with the postal administrations of foreign countries for repressing the circulation of obscene publications.

RECOMMENDATIONS FOR LEGISLATION.

By way of suggestion the following tentative drafts of legislation embodying certain recommendations of the department are submitted:

INCREASE OF RATE ON SECOND CLASS MAIL.

To increase the rate of postage on second class mail from 1 cent per pound to 2 cents per pound:

That the postage rate on second class matter mailed by publishers to subscribers, to news agents, and as sample copies, and by news agents to their subscribers or to other news agents shall be 2 cents a pound for other than free-in-county matter.

CONSOLIDATION OF THIRD AND FOURTH CLASSES OF MAIL.

To consolidate the third and fourth classes of mail, so that all merchandise shall be covered by the provisions of the parcel post law:

That on and after the passage of this act third and fourth class mail, as now defined by law, shall be consolidated and be known as parcel post mail, and shall be subject in all respects to the provisions of section eight of the act approved August twenty-fourth, nineteen hundred and twelve, making appropriations for the service of the Post Office Department for the fiscal year ending June thirtieth, nineteen hundred and thirteen, and for other purposes, and all laws and parts of laws in conflict with this act are hereby repealed.

REPEAL OF SPECIAL RATE FOR SEEDS, CUTTINGS, BULBS, ROOTS, SCIONS, AND PLANTS.

To equalize the postage rates on all kinds of fourth class or parcel post mail by repealing the special rate on seeds, cuttings, etc.:

That the postage rate on seeds, cuttings, bulbs, roots, scions, and plants shall be the same as that chargeable on other parcel post mail.

RETURN POSTAGE.

To provide for the prepayment by the sender of postage on advertising matter mailed for return:

That the Postmaster General is hereby authorized to extend to the senders of advertising mail, who desire to pay postage on replies thereto, the privilege of depositing, on mailing such matter in quantities of at least two thousand pieces, a sufficient sum to pay first class postage on the replies, the payment to be made in such way and under such regulations as the Postmaster General may prescribe.

OFFICIAL POSTAGE STAMPS FOR FRANKING.

To prevent abuses of the free mailing privilege and to enable the Postmaster General to maintain a proper postage account covering free mail:

That the Postmaster General shall furnish, under such regulations as he may prescribe, official postage stamps, stamped envelopes, wrappers, address slips, and postal cards for use by all officers of the United States and other persons authorized by law to transmit mail free of postage; and after July first, nineteen hundred and thirteen, no such officer or person shall transmit any matter by mail without prepayment of postage by means of the official stamped paper herein authorized; and the Postmaster General shall keep a detailed account of the disposition of such stamped paper; and all laws and parts of laws in conflict herewith are hereby repealed.

RESTRICTION OF THE FRANKING PRIVILEGE.

To restrict the use of the franking privilege to official correspondence and to the mailing of such speeches and documents as are printed by order of Congress:

That the use of the franking privilege shall be limited to the mailing of official correspondence, not exceeding four ounces in weight, and to the distribution of copies of such speeches and documents as are printed by order of Congress.

HOLDING OF MAIL FOR POSTAGE.

To enable the department, under suitable regulations, to forward and deliver to the addressees, on the payment in each case of double the amount of the unpaid postage, any or all classes of mail on which postage is not prepaid or is insufficiently prepaid:

That mail of such classes as the Postmaster General may prescribe, on which postage is not prepaid or is insufficiently prepaid, shall be forwarded to its destination, but double the amount of unpaid postage shall be collected on delivery; and all laws and parts of laws in conflict herewith are hereby repealed.

DISPOSITION OF DEAD MAIL.

To facilitate the disposition of undeliverable mail of all classes and to enable the department to eliminate the objectionable lottery features inherent in the present method of selling dead mail:

That sections 3937 and 3938 of the Revised Statutes be amended to read as follows:

"SEC. 3937. All undeliverable domestic letters deposited in any post office for mailing shall be sent by the postmaster to the Division of Dead Letters or such branches thereof as may be designated by the Postmaster General.

SEC. 3938. The Postmaster General may establish branches of the Division of Dead Letters at such post offices as the needs of the service may require. All dead letters and parcels containing valuable inclosures shall be recorded in the Division of Dead Letters, or the branches thereof, and when they can not be delivered to the addressee or to the sender shall be held, subject to reclamation, for one year. If within said period they shall not have been reclaimed, such letters and parcels shall be disposed of as the Postmaster General may direct.

REGISTERED AND INSURED MAIL INDEMNITY ACCOUNT.

To avoid the need of numerous special appropriations, to improve the method of accounting for receipts and disbursements on account of losses of registered and insured articles, and to permit the immediate payment of indemnity claims, both foreign and domestic, without regard to fiscal years:

That all unexpended balances to the credit of existing appropriations for indemnity for lost registered mail, either domestic or international, irrespective of the fiscal years for which such appropriations were made, together with all moneys in the hands of officers and agents of the Post Office Department, and all moneys which shall hereafter be recovered, collected, or received from any source whatever on account of lost registered and insured mail, either foreign or domestic, shall be deposited in the Treasury of the United States to the credit of the service of the Post Office Department, to constitute a continuous, reimbursable appropriation, to be denominated "Indemnity for lost registered and insured mail." All appropriations for the payment of indemnity for the loss of registered and insured mail, either foreign or domestic, and all moneys deposited as herein provided, shall be available until expended, without regard to fiscal years, for the payment of indemnity for lost registered and insured mail, either foreign or domestic, and for the reimbursement to the owners of moneys collected in excess of the amount of indemnity or insurance provided.

REPEAL OF THE FREE REGISTRATION PRIVILEGE ON CURRENCY MAILED IN FOR REDEMPTION.

To make uniform to the public the fee charged for registering mail:

That the registry fee on letters containing fractional or other currency of the United States sent to the Treasurer for redemption shall be the same as that charged on other registered mail.

DOMESTIC MONEY ORDER FEES.

To empower the Postmaster General, who now fixes international money-order fees, to adjust the fees for domestic money orders:

That the schedule of fees chargeable for the issuance of domestic money orders shall be fixed by the Postmaster General, and shall not be less than 5 cents, nor more than 25 cents, for the issuance of a single order.

PAYMENT OF INVALID MONEY ORDERS.

To provide for the payment of invalid money orders by reissues of such money orders, instead of by the issuance of a payment warrant, as at present:

That hereafter no domestic money order shall be payable unless presented to the post office on which it is drawn, or at which it was issued, within one year from the last day of the month of its issue, but the Postmaster General may, under appropriate regulations, on application by the remitter, payee, or indorsee, cause a new order to be issued in lieu thereof.

CHANGE IN THE LIMITATION ON A POSTAL SAVINGS DEPOSIT.

To remove the restrictions on the amount that may be accepted by the Postal Savings System from one depositor, with the proviso that interest shall not be paid on more than $1,000:

That the provisions of sections six and seven of the postal savings act of June twenty-fifth, nineteen hundred and ten, are hereby amended so as to remove the limitation on the amount that may be accepted for deposit from any one person: *Provided*, That no interest shall be paid on any amount in excess of $1,000 deposited by such person.

ADVANCEMENT OF FOURTH CLASS OFFICES.

To permit the advancement to the presidential class of any fourth class office, provided the postmaster's compensation for the year amounts to $1,000, irrespective of whether it amounts to $250 for each quarter, as now required:

That after June thirtieth, nineteen hundred and thirteen, when the total compensation of any postmaster at a post office of the fourth class for four consecutive quarters shall amount to $1,000, exclusive of commissions on money orders issued, and the receipts of such post office for the same period shall aggregate as much as $1,900, the Auditor for the Post Office Department shall so report to the Postmaster General, who shall, in pursuance of such report,

assign such post office to its proper class, to become effective at the beginning of the next succeeding quarterly period, and fix the salary of the postmaster accordingly.

READJUSTMENT OF POSTMASTERS' SALARIES.

To give the department six months instead of three in which to complete the readjustment for the ensuing fiscal year of presidential postmasters' salaries, by basing them on the gross receipts of the offices for the four quarters ending December 31 instead of March 31:

That after June thirtieth, nineteen hundred and thirteen, the compensation of postmasters at post offices of the first, second, and third classes shall be annual salaries, graded in even hundreds of dollars, and payable in quarterly installments, and shall be ascertained and fixed by the Postmaster General on the basis of the gross receipts of their respective offices for the calendar year, to take effect at the beginning of the ensuing fiscal year.

REIMBURSEMENT OF POSTMASTERS FOR LOSSES OF KEY-DEPOSIT FUNDS.

To authorize the reimbursement of postmasters for losses of key-deposit funds:

That the provisions of the act of May ninth, eighteen hundred and eighty-eight, chapter two hundred and thirty-one, as amended by the act of June eleventh, eighteen hundred and ninety-six, chapter four hundred and twenty-four, are hereby amended so as to include key-deposit funds.

REIMBURSEMENT OF POSTMASTERS FOR POSTAL SAVINGS LOSSES.

To authorize the reimbursement of postmasters for certain losses of postal savings funds and postal savings stamps:

That the provisions of the act of March seventeenth, eighteen hundred and eighty-two, "Authorizing the Postmaster General to adjust certain claims of postmasters for loss by burglary, fire, or other unavoidable casualty," as amended by the acts approved May ninth, eighteen hundred and eighty-eight, and June eleventh, eighteen hundred and ninety-six, are hereby amended so as to include postal savings funds, cards, and stamps belonging to the United States that may have been lost while in the hands of a postmaster or in transit by mail to the authorized place for the deposit or transfer of such postal savings funds, cards, and stamps.

INITIAL APPOINTMENT OF POST OFFICE CLERKS AND CITY LETTER CARRIERS AT $800.

To appoint post office clerks and city letter carriers at an initial salary of $800 per annum:

That after June thirtieth, nineteen hundred and thirteen, clerks and city letter carriers in first and second class post offices shall be appointed at the initial salary of $800.

MAXIMUM SALARY FOR RURAL MAIL CARRIERS.

To provide for an increase in the maximum salary allowed to rural carriers:

That on and after July first, nineteen hundred and thirteen, letter carriers of the Rural Delivery Service shall receive a salary not exceeding $1,200 per annum.

COMPENSATION TO INJURED EMPLOYEES.

To extend to all postal employees injured in the line of duty the same privileges and compensation now provided by law for railway postal clerks:

That any employee of the postal service who is disabled by accidental injury, not due to his own negligence, received while performing his official duties, may be granted leave of absence with full pay during the period of his disability, but not for more than one year, and then at half pay for the further period of disability, if any, but not exceeding one year additional; and if he dies within a year as a result of the injury, leaving a widow, or children under sixteen years of age, or dependent parents, such widow, children, and dependent parents shall be entitled to receive, in such portions as the Postmaster General may decide, the sum of $2,000.

ANNUAL LEAVE FOR EMPLOYEES.

To grant 30 days' leave of absence to all postal employees who render service equivalent to that of the departmental employees at Washington:

That hereafter the Postmaster General may allow not exceeding thirty days' annual leave with pay, under such conditions as he shall prescribe, to assistant postmasters, supervisory officers, clerks, city letter carriers, printers, mechanics, skilled laborers, watchmen, messengers, and laborers at first and second class post offices, and also to railway postal clerks whose duties require them to work six days or more a week throughout the year.

LEAVE WITH PAY, ON ACCOUNT OF SICKNESS, TO RAILWAY POSTAL CLERKS.

To extend the provisions of existing law so as to allow railway postal clerks leave of absence with pay on account of sickness, substitutes to be provided at the expense of the Government instead of at the expense of the clerks:

That hereafter the Postmaster General may allow leave of absence with pay, not exceeding thirty days in any one fiscal year, to any railway postal clerk on account of personal illness, the substitute clerk in such case to be provided at the expense of the Government.

LEAVE, WITH SUBSTITUTE, IN RAILWAY MAIL SERVICE.

To enable the Postmaster General, in his discretion, to grant suitable leave of absence to railway postal clerks who are not entitled to leave under the present law:

That hereafter the Postmaster General may, in his discretion, under such regulations as he may provide, allow any railway postal clerk who is not entitled to annual leave under other provision of law leave of absence with pay for a period not exceeding thirty days, with the understanding that his duties will be performed without expense to the Government during the period for which leave is granted, he to provide a substitute at his own expense.

PAYMENT TO CARRIER WHEN CONTRACTOR FAILS TO PAY.

To enable the Postmaster General to pay a carrier who has performed service for a contractor or subcontractor on a mail route the price agreed on by them within two months after the expiration of the month in which such service shall have been performed, provided the contractor or subcontractor shall not have paid such carrier the amount due, by substituting the word "month" for the word "quarter" in the third proviso of the act of May 4, 1882 (22 Stat. L., ch. 116, p. 54), so as to make the said proviso read as follows:

If any person shall hereafter perform any service for any contractor or subcontractor in carrying the mail, he shall, upon filing in the department his contract for such service and satisfactory evidence of its performance, thereafter have a lien on any money due such contractor or subcontractor for such service to the amount of same; and if such contractor or subcontractor shall fail to pay the party or parties who have performed service as aforesaid the amount due for such service within two months after the expiration of the month in which such service shall have been performed the Postmaster General may cause the amount due to be paid said party or parties and charged to the contractor: *Provided*, That such payment shall not in any case exceed the rate of pay per annum of the contractor or subcontractor.

POST OFFICES IN FEDERAL BUILDINGS.

To bring the selection of sites and the preparation of plans for Federal buildings to be used exclusively as post offices under the immediate control of the Post Office Department and to make this department jointly responsible with the Treasury Department for the selection of sites and the preparation of plans for buildings to be constructed for the joint use of post offices and other Government offices:

That hereafter all sites for public buildings to be used exclusively for post offices shall be selected by the Postmaster General: *Provided*, That whenever a public building is to be constructed for the joint use of a post office and other Government office or offices the selection of the site therefor shall be made and approved by the Secretary of the Treasury and the Postmaster General: *And provided further*, That the plans and estimates for any public building to be used wholly or in part as a post office, so far as they relate to the post office quarters, shall be based on specifications and estimates for space, interior arrangement, and equipment to be furnished by the Postmaster General.

BRANCH POST OFFICES AND POSTAL STATIONS.

To remove the restriction that prevents the establishment beyond the corporate limits of a city of branch post offices and postal stations in places of less than 1,500 inhabitants or more than 5 miles distant and to simplify postal accounting by enabling the department to convert small independent post offices in the neighborhood of cities into nonaccounting branches:

That the Postmaster General may establish post offices at such places as he may deem expedient and may establish postal stations within the delivery area of any post office and shall prescribe the rules and regulations for the government of branch post offices and postal stations.

POST OFFICE EQUIPMENT.

To enable the department to furnish equipment for rented post office quarters, thus obviating the necessity of paying excessive rental:

That the Postmaster General may expend for the purchase, maintenance, and repair of equipment for the use of post offices of the presidential grade not to exceed five per cent of the annual appropriations for rent, light, and fuel for post offices of the first, second, and third classes.

PRIVATE MAIL RECEPTACLES.

To expedite the delivery of mail by city letter carriers by requiring mail receptacles to be provided by patrons:

That after December thirty-first, nineteen hundred and fourteen, delivery of mail by city letter carriers shall be made only at such residences and places of business as provide at the door or entrance suitable receptacles for its deposit.

STANDARD RURAL MAIL BOX.

To provide for a standard mail box to be manufactured for the department and sold to patrons of rural mail routes:

That the Postmaster General shall adopt a uniform style of mail box for use on rural mail routes, and shall arrange to have such boxes manufactured and sold to patrons of rural delivery and star routes at cost, including expense of delivery. On and after July first, nineteen hundred and fourteen, all mail boxes of patrons placed in service on rural mail routes must be provided in the manner herein set forth.

PROTECTION OF MAIL BOXES.

To obviate the necessity for establishing the fact that the Postmaster General has approved mail boxes on mail routes in the trial of persons charged with injuring or destroying such boxes:

That section three of the Act of March third, nineteen hundred and three, chapter one thousand and nine, be amended to read as follows:

"Whoever shall willfully or maliciously injure, tear down, or destroy any letter box or other receptacle intended or used for the receipt or delivery of mail on any mail route, or shall break open the same or willfully or maliciously injure, deface, or destroy any mail deposited therein, or shall willfully take or steal such mail from or out of such letter box or other receptacle, or shall willfully aid or assist in any of the aforementioned offenses, shall for every such offense be punished by a fine of not more than $1,000 or by imprisonment for not more than three years."

TRANSFER OF FRAUD INVESTIGATIONS TO THE DEPARTMENT OF JUSTICE.

To transfer to the Department of Justice the work of investigating frauds committed through the mails:

That hereafter all investigations of cases involving the use of the mails to defraud shall be made under the direction of the Attorney General.

TEMPORARY STAR ROUTE SERVICE.

To enable the Postmaster General to employ temporary service on star routes without advertisement:

That temporary mail service rendered necessary by reason of the failure of any bidder or contractor to perform the service contracted for by him may be provided by the Postmaster General without advertisement, on such terms as he may deem reasonable, at the expense of any such failing bidder or contractor, and all laws or parts of laws inconsistent herewith are hereby repealed.

PAYMENT FOR OCEAN MAIL SERVICE.

To enable the department to provide contract ocean mail service between the United States and ports of South America, the Philippines, Japan, China, and Australasia, 4,000 miles or more distant, and to ports on the Isthmus of Panama:

That the Postmaster General is hereby authorized to pay for ocean mail service, under the act of March third, eighteen hundred and ninety-one, in vessels of the second class on routes to South America, to the Philippines, to Japan, to China, and to Australasia, four thousand miles or more in length, outward voyage, or on routes to the Isthmus of Panama, at a rate per mile not exceeding the rate applicable to vessels of the first class, as provided in said act.

NEW METHOD OF FIXING RAILWAY MAIL PAY.

To determine the compensation of railroad companies for the transportation of the mails on the basis of the amount of space required in cars and of the frequency of service:

The Postmaster General is authorized and directed to require companies operating railroads by steam, electricity, or other motive power carrying the mails to furnish under oath and seal not less frequently than once in each fiscal year such information relating to the service, operation, receipts, and expenditures and such other information of such roads for a period of not less than thirty days, to be designated by him, as may in his judgment be deemed necessary to enable him to ascertain the cost to the companies of carrying the mails on their respective roads and the proper compensation to be paid for that service. He shall require all such companies to submit such information not later than March first, nineteen hundred and fourteen, and in each fiscal year thereafter at such times and for such periods as he shall prescribe. It shall be the duty of such railroad companies to furnish such information, and if any railroad company fails or refuses to do so when required, its compensation for service rendered thereafter until such company shall comply and an adjustment is made by the Postmaster General shall be forfeited to the United States and shall be withheld as liquidated damages.

If any officer, agent, or employee of a railroad company shall knowingly furnish any information required under the provisions of this act that is false and fraudulent he shall be fined not more than $20,000 and imprisoned not more than five years.

The Postmaster General shall determine the cost to each railroad company of carrying the mails on its respective road or roads, and shall verify and state the result in such form and manner as he shall deem proper. For this purpose

he shall transmit the information furnished by the railroad companies relating to the operating expenditures to the Interstate Commerce Commission, who shall credit, assign, and apportion such operating expenditures to the passenger and freight services, and report the result as to the passenger service to the Postmaster General. The Postmaster General is authorized to credit, assign, and apportion the passenger operating expenses as reported to him by the Interstate Commerce Commission and the taxes in such manner as will determine the proportion thereof chargeable to the mail service, a statement of which shall be given the company concerned. If any railroad company shall object to the method of crediting, assigning, and apportioning the passenger operating expenses and taxes to the mail service, it may file objection with the Postmaster General within twenty days after such statement is made to the company, and the Postmaster General shall thereupon certify the method and objection and such papers as in his judgment may be essential to an understanding of the method to the Interstate Commerce Commission, who shall review the finding of the Postmaster General and affirm, modify, or revise the same, and certify the result to the Postmaster General, which action thereon shall be final.

The Postmaster General is authorized and directed to readjust the pay to companies operating railroads for the transportation and handling of the mails and furnishing facilities in connection therewith not less frequently than once in each fiscal year, commencing with July first, nineteen hundred and fourteen, at a rate of compensation per annum equal to the cost to the railroad companies of carrying the mails as ascertained by him and six per centum of such cost; in addition companies may be allowed such additional amounts, if any be necessary, as shall render the whole a proper proportion of a fair and reasonable return on the value of the property necessarily employed in connection with the mail service: *Provided*, That when such sum does not equal $25 per mile per annum he may, in his discretion, allow not exceeding such rate.

Railroad companies whose railroads were constructed in whole or in part by a land grant made by Congress, on the condition that the mails should be transported over their roads at such price as Congress should by law direct, shall receive not exceeding the cost to them of performing the service.

Information shall be furnished and adjustments made as near as practicable by accounting systems or roads, and the cost and the compensation for the term shall be stated for all service covered by each system or road. The routes for a system or road may be stated for administrative purposes in such manner as the Postmaster General may determine.

The Postmaster General may order new or additional service during a term for which an adjustment shall have been made or service authorized on any system or road, in any train operated by such system or road over any part of the trackage included in the adjustment or authorization, and without additional compensation therefor during such term.

He may order service over new or additional trackage of an adjusted system or road during a term and state the amount performed for the remainder of such term on statistics obtained for the first thirty days of service. Payment therefor may be made at not exceeding the average rate per car-foot mile for the system or road ascertained at the regular adjustment. Entire discontinuance of service over trackage included in the adjustment or thereafter added shall be deducted for at the car-foot mile rate of adjustment or mile rate of authorization. In case the operation of service over trackage included in an adjustment or thereafter added is undertaken by another company during the term, the same may be recognized by the Postmaster General, provided the

companies in interest shall file with him their joint agreement as to the part of the compensation of the old operating company to be paid the new operating company; otherwise payment to the company first authorized shall be full payment for all service performed for the term.

The Postmaster General may order service over trackage of a railroad company not operating service under an adjustment or authorization after the regular adjustment for the remainder of the term, and pay therefor at not exceeding $42.75 per mile of trackage per annum.

Service over property owned or controlled by a terminal company shall be considered service of the roads or systems using such property and not that of the terminal company.

Railroad companies carrying the mails shall furnish all necessary facilities for caring for and handling them while in their custody. They shall furnish all cars or parts of cars used in the transportation and distribution of the mails, and place them in stations before the departure of trains when required to do so. They shall provide, side, terminal, and direct transfer service and all station and depot space and rooms for handling, distribution, and transfer of mails en route, and for offices and rooms for the employees of the postal service engaged in such transportation, when ordered by the Postmaster General.

Every railroad company carrying the mails shall carry on any train it operates, and without extra charge therefor, the persons in charge of the mails, and when on duty and traveling to and from duty, and all duly accredited agents and officers of the Post Office Department and the postal service, while traveling on official business, upon the exhibition of their credentials.

All cars or parts of cars used for the Railway Mail Service shall be of such construction, style, length, and character and furnished in such manner as shall be required by the Postmaster General, and shall be constructed, fitted up, maintained, heated, lighted, and cleaned by and at the expense of the railroad companies. No payment shall be made for service by any railway post-office car which is not sound in material and construction and which is not equipped with sanitary drinking-water containers and toilet facilities, nor unless such car is regularly and thoroughly cleaned. No pay for service shall be allowed for the operation of any wooden railway post-office car unless constructed substantially in accordance with the most approved plans and specifications of the Post Office Department for such type of cars, nor for any wooden railway post-office car run in any train between adjoining steel or steel underframe cars, or between the engine and steel or steel underframe car adjoining. After the first of July, nineteen hundred and seventeen, the Postmaster General shall not approve or allow to be used or pay for any full railway post-office car not constructed of steel or steel underframe or equally indestructible material, and not less than twenty-five per centum of the railway post-office cars of a railroad company not conforming to this provision shall be replaced with cars constructed of steel annually after June nineteen hundred and thirteen; and all cars accepted for this service and contracted for by the railroad companies after the passage of this act shall be constructed of steel. The Postmaster General shall make deductions from the pay of the railroad companies on the basis of the value of the service computed on the car-foot mile basis in all cases where the cars do not comply with the provisions of this act.

The space in cars devoted to the use of the mails, as ascertained during the period fixed by the Postmaster General for the rendition of information by the railroad companies, shall be taken as the basis for computing the car-foot miles devoted to the mail service for the purpose of readjustment, effective from the first of July next following: *Provided*, That no credit shall be given for space

in cars devoted to the distribution of the mails unless such space shall be authorized by the Postmaster General or unless he shall determine that its use is made necessary by a specific authorization. In computing the car-foot miles the mail service shall be charged in both directions for a line of railway post-office cars with the maximum space authorized in either direction.

If any railroad company shall fail or refuse to provide cars or apartments in cars for distribution purposes when required by the Postmaster General, or shall fail or refuse to construct, fit up, maintain, heat, light, and clean such cars and provide such appliances for use in case of accident as may be required by the Postmaster General, it shall be fined such sum as shall, in the discretion of the Postmaster General, be deemed proper.

The Postmaster General shall in all cases decide upon what trains and in what manner the mails shall be conveyed. Every railroad company carrying the mails shall carry on any train it operates all mailable matter directed to be carried thereon. If any railroad company shall fail or refuse to transport the mails when required by the Postmaster General upon any train or trains it operates, such company shall be fined such amount as may, in the discretion of the Postmaster General, be deemed proper.

The Postmaster General may make deductions from the pay of railroad companies carrying the mails under the provisions of this act for reduction in service or frequency of service where, in his judgment, the importance of the facilities withdrawn or reduced requires it and impose fines upon them for delinquencies. He may deduct the price of the value of the service in such cases where it is not performed, and not exceeding three times its value if the failure be occasioned by the fault of the railroad company.

The Postmaster General is authorized to have such weights of mails and measurements of space taken and to collect such other information by sworn employees of the Post Office Department as he may deem necessary and to have such information stated and verified to him by such employees, under such instructions as he may consider just to the Post Office Department and the railroad companies, to assist in the ascertainment of the space used for the transportation and the handling of the mails on railroads, and to employ such special clerical and other assistance as shall be necessary to carry out the provisions of this act, and to rent quarters in Washington, District of Columbia, if necessary, for the clerical force engaged thereon, and to pay for the same out of the appropriation for inland transportation by railroads.

The provisions of this act shall apply to service operated by railroad companies partly by railroad and partly by steamboats.

The provisions of this act respecting the rate of compensation and the determination thereof shall not apply to mails conveyed under special arrangement in freight trains, for which a rate not exceeding the usual and just freight rates may be paid, in accordance with the classifications and tariffs approved by the Interstate Commerce Commission.

It shall be unlawful for any railroad company to refuse to carry the mails at the rates of compensation provided by law when and for the period required by the Postmaster General so to do, and for every such offense it shall be fined not exceeding $5,000.

All laws and parts of laws inconsistent herewith are hereby repealed.

FINANCIAL SUMMARY.

Following is a statement of the revenues and expenditures on account of the postal service for the last fiscal year in comparison with the year preceding:

Comparison of revenues and expenditures for the fiscal year ended June 30, 1912, with those of the preceding year.

Items.	Fiscal year. 1911	1912
REVENUES.		
Ordinary postal revenues	$232,607,557.29	$241,422,336.86
Revenues from money-order business	5,272,266.31	5,321,679.02
Total revenues from all sources	237,879,823.60	246,744,015.88
EXPENDITURES.		
Expenditures on account of the current year	230,516,814.45	240,204,695.21
Expenditures on account of previous years	7,132,112.23	8,320,754.87
Total expenditures during the year	237,648,926.68	248,525,450.08
Total revenues during the year	237,879,823.60	246,744,015.88
Excess of revenues over expenditures	230,896.92	
Excess of expenditures over revenues		1,781,434.20
Amount of losses by fire, burglary, bad debts, etc	11,778.80	4,088.90
Surplus in the postal revenues for the fiscal year ended June 30, 1911	219,118.12	
Deficit in the postal revenues for the fiscal year ended June 30,1912		★ 1,785,523.10

★ This deficit, which was due to extraordinary revenue losses resulting from the exceptionally large mailings of franked matter in the political primaries, proved to be only temporary, for during the succeeding five months the department's income has again outstripped its expenses.

REVENUES IN DETAIL.

Postal revenues:	
Sales of stamps, stamped envelopes, newspaper wrappers, and postal cards	$221,563,619.00
Second-class postage (pound rate) paid in money	9,399,140.61
Third and fourth class postage paid in money	5,444,615.19
Receipts from box rents	4,645,664.04
Letter postage paid in money (made up principally of balances due from foreign administrations)	209,263.76
Miscellaneous receipts	71,709.92
Fines and penalties	55,201.95
Receipts from unclaimed letters	33,122.39
Total postal revenues	241,422,336.86
Money-order revenues:	
Revenues from domestic and international money-order business	4,843,364.74
Revenues from invalid money orders	478,314.28
Total revenues from all sources	246,744,015.88

EXPENDITURES IN DETAIL.

The expenditures of the postal service during the fiscal year were as follows:

Items.	On account of the fiscal year 1912.	On account of previous fiscal years.	Total.
Transportation of mails on railroads	$43,245,798.86	$3,850,185.30	$47,095,984.16
Compensation to assistant postmasters and clerks in post offices	42,465,396.25	19,061.12	42,484,457.37
Rural delivery	41,764,512.76	76,398.18	41,840,910.94
City delivery	34,152,517.77	10,045.06	34,162,562.83
Compensation to postmasters	28,643,824.15	3,902.17	28,647,726.32
Railway Mail Service	20,626,960.08	84,715.04	20,711,675.12
Transportation of mails on star routes	6,174,100.47	703,112.28	6,877,212.75
Railway post office car service	3,535,620.08	1,059,696.97	4,595,317.05
Rent, light, and fuel for first, second, and third class post offices	4,248,384.13	32,084.57	4,280,468.70
Transportation of foreign mails	2,361,182.09	682,450.35	3,043,632.44
Transportation of mails—wagon service	1,549,548.49	138,331.60	1,687,880.09
Mail-messenger service	1,462,144.31	136,643.14	1,598,787.45
Manufacture of stamped envelopes	1,295,508.63	57,101.51	1,352,610.14
Special-delivery service	1,479,482.73	116.70	1,479,599.43
Post-office inspectors	1,013,348.16	88,857.66	1,102,205.82
Transportation of mails—pneumatic-tube service	854,205.23	76,667.78	930,873.01
Balances due foreign countries	248,639.75	613,934.40	862,574.15
Transportation of mails on steamboats	696,472.21	138,626.99	835,099.20
Transportation of mails—electric and cable cars	623,333.68	57,189.19	680,522.87
Manufacture of postage stamps	606,902.31	10,853.26	617,755.57
Payment of money orders more than 1 year old	509,387.28	----------	509,387.28
Freight and expressage on supplies	297,350.48	200,722.26	498,072.74
Miscellaneous items at first and second class post offices	306,256.92	1,950.29	308,207.21
Mail bags, cord fasteners, label cases, etc	265,660.45	28,233.22	293,893.67
Canceling machines	292,224.77	1,598.66	293,823.43
Manufacture of postal cards	237,507.94	9,037.77	246,545.71
Wrapping twine	187,581.34	25,660.42	213,241.76
Mail transportation in Alaska, star	180,342.35	----------	180,342.35
Blanks, blank books, etc., for money-order service	133,758.00	9,929.60	143,687.60
Stationery	91,870.34	24,887.28	116,757.62
Supplies, City Delivery Service	69,278.78	35,084.74	104,363.52
Laborers, mail-bag repair shops	98,914.56	----------	98,914.56
Shipment of supplies	61,950.56	21,950.89	83,901.45
Typewriters, copying presses, etc	66,549.97	15,861.81	82,411.78
Official registry envelopes	57,116.28	6,728.70	63,844.98
Facing slips, etc	47,064.50	14,824.76	61,889.26
Supplies, Rural Delivery Service	22,650.21	25,961.65	48,611.86
Labor-saving devices	45,419.86	651.05	46,070.91
Postmarking, rating, and money-order stamps	33,099.52	7,956.74	41,056.26
Building for use of Post Office Department	26,200.00	8,200.00	34,400.00
Laborers, mail-lock repair shop	33,991.91	83.01	34,074.92
Distribution of stamped and official envelopes	24,444.52	259.84	24,704.36
Expenditures under 25 smaller items of appropriation (less than $20,000 each)	68,192.53	41,198.91	109,391.44
Total expenditures during the fiscal year	240,204,695.21	8,320,754.87	248,525,450.08

GROWTH OF THE POSTAL SERVICE.

Receipts and expenditures for certain years from 1800 to 1912.

Items.	1800	1810	1820	1830
Receipts	$280,804	$551,684	$1,111,927	$1,850,583
Expenditures	213,994	495,969	1,160,926	1,932,708
Excess of receipts	66,810	55,715		
Excess of expenditures			48,999	82,125

Items.	1840	1850	1860	1870
Receipts	$4,543,522	$5,499,984	$8,518,067	$19,772,221
Expenditures	4,718,236	5,212,953	19,170,610	23,998,837
Excess of receipts		287,031		
Excess of expenditures	174,714		10,652,543	4,226,616

Items.	1880	1890	1900	1903
Receipts	$33,315,479	$60,882,098	$102,354,579	$134,224,443
Expenditures	36,542,804	66,259,548	107,740,267	138,784,487
Excess of expenditures	3,227,325	5,377,450	5,385,688	4,560,044

Items.	1904	1905	1906	1907
Receipts	$143,582,624	$152,826,585	$167,932,782	$183,585,005
Expenditures	152,362,116	167,399,169	178,449,778	190,238,288
Excess of expenditures	8,779,492	14,572,584	10,516,996	6,653,283

Items.	1908	1909	1910	1911	1912
Receipts	$191,478,663	$203,562,383	$224,128,657	$237,879,823	$246,744,015
Expenditures	208,351,886	221,004,102	229,977,224	237,648,926	248,525,450
Excess of expenditures	16,873,223	17,441,719	5,848,567		1,781,435
Excess of receipts				230,897	

Annual expenditures, by items, for the years 1903 to 1912, inclusive.

Items.	1903	1904	1905
Service in post offices:			
Salaries of postmasters	$21,631,751.46	$22,273,415.63	$22,743,521.43
Salaries of clerks, etc	18,766,847.18	21,043,973.86	23,125,718.92
City Delivery Service	19,342,908.70	20,585,570.31	20,923,392.35
All other expenditures	5,781,011.34	6,135,161.60	7,152,286.82
Total	65,522,518.68	70,038,121.40	73,944,919.52
Railway Mail Service	11,232,184.11	12,106,130.09	13,289,368.41
Rural Delivery Service	8,101,928.85	12,681,876.90	20,824,269.44
Transportation of domestic mail:			
By railroads	41,377,183.59	43,971,847.50	45,040,563.62
By other means of transportation	9,801,065.62	10,697,624.54	11,302,795.22
Total	51,178,249.21	54,669,472.04	56,343,358.84
Transportation of foreign mail	2,608,216.44	2,708,479.52	2,832,432.11
Payment on account of invalid money orders	141,390.68	158,036.75	164,820.91

Annual expenditures, by items, for the years 1903 to 1912, inclusive—Continued.

Items.	1906	1907	1908
Service in post offices:			
Salaries of postmasters	$23,548,988.33	$24,580,667.25	$25,602,973.86
Salaries of clerks, etc	24,700,645.34	26,647,397.21	30,920,449.68
City Delivery Service	22,095,211.92	23,356,941.90	26,450,138.33
All other expenditures	7,501,831.70	8,788,126.13	9,649,691.38
Total	77,846,676.39	83,373,132.49	92,623,253.25
Railway Mail Service	14,182,087.57	15,178,374.82	17,390,532.15
Rural Delivery Service	24,773,613.58	26,666,889.22	34,455,269.59
Transportation of domestic mail:			
By railroads	46,953,438.60	49,758,071.01	48,458,255.34
By other means of transportation	11,449,199.43	12,002,580.70	11,962,539.41
Total	58,402,638.03	61,760,651.71	60,420,794.75
Transportation of foreign mail	3,052,890.46	3,031,038.24	3,084,025.44
Payment on account of invalid money orders	191,872.86	228,201.86	378,010.97

Items.	1909	1910	1911	1912
Service in post offices:				
Salaries of postmasters	$26,571,911.15	$27,514,362.80	$28,284,964.11	$28,647,726.32
Salaries of clerks, etc	34,876,492.71	38,045,456.02	40,364,930.39	42,484,457.37
City Delivery Service	29,869,783.03	31,805,485.28	33,165,067.58	34,266,926.35
All other expenditures	10,061,092.05	10,405,405.69	11,083,406.74	11,118,292.23
Total	101,379,278.94	107,770,710.39	112,898,368.82	116,517,402.27
Railway Mail Service	18,356,800.13	19,389,414.44	20,106,909.40	20,711,675.12
Rural Delivery Service	35,586,779.50	37,073,732.64	37,145,756.65	41,889,522.80
Transportation of domestic mail:				
By railroads	49,869,374.52	49,405,311.27	50,583,122.96	51,691,301.21
By other means of transportation	12,382,475.27	12,534,500.99	13,175,365.83	13,288,790.46
Total	62,251,849.79	61,939,812.26	63,758,488.79	64,980,091.67
Transportation of foreign mail	2,943,849.32	3,203,821.23	3,315,349.28	3,917,370.94
Payment on account of invalid money orders	485,545.21	599,733.54	424,053.74	509,387.28

NOTE.—In addition to the foregoing, there were certified to the Secretary of the Treasury certain claims of Government-aided Pacific railroads for transportation of domestic mail. These amounts, which were not charged to postal revenues and therefore are not included in the foregoing statement, were as follows:

Fiscal year.	Total.	Fiscal year.	Total.
1901	$612,503.40	1907	$786,029.11
1902	593,358.89	1908	751,099.69
1903	738,500.76	1909	None.
1904	739,703.06	1910	None.
1905	740,697.24	1911	None.
1906	741,171.66	1912	None.

For a more detailed account of the operations of the several branches of the postal service during the year attention is invited to the annual reports of the four Assistant Postmasters General.

Respectfully,

FRANK H. HITCHCOCK,
Postmaster General.

REPORT OF THE FIRST ASSISTANT POSTMASTER GENERAL.

POST OFFICE DEPARTMENT,
FIRST ASSISTANT POSTMASTER GENERAL,
Washington, December 1, 1912.

SIR: I have the honor to submit the annual report of this bureau for the fiscal year ended June 30, 1912.

THE POST-OFFICE SERVICE.

The gross revenues of the service for the fiscal year amounted to $246,744,015.88, an increase of only 3.72 per cent.

Under the act of Congress requiring the annual readjustment of presidential postmasters' salaries on the basis of the gross receipts for the four quarters ending March 31 of each year, the number of offices assigned to the first class on July 1, 1912, increased to 457, to the second class to 1,940, and to the third class to 5,830, a total of 8,227 presidential post offices, a net increase of 232. On June 30, 1912, there were in operation 58,729 post offices of all classes.

The annual rate of expenditure for the salaries of presidential postmasters on July 1, 1912, was $14,566,700, as follows: First class, $1,628,900; second class, $4,576,100; third class, $8,361,700, a net increase over the annual rate of expenditure on July 1, 1911, of $350,000.

During the year 1,979 postmasters were appointed at presidential post offices. Of this number 1,404 were reappointed. At fourth-class post offices 7,630 postmasters were appointed.

At the close of the fiscal year there were 2,329 assistant postmasters at first and second class offices, an increase of 99. The number of clerks at first and second class offices increased from 32,319 to 33,714 and the carrier force at city delivery offices from 29,168 to 29,962, being a net increase of 1,395 clerks and 794 carriers. Of the additional clerks appointed 130 were assigned to new second-class offices. During the year there were appointed 4,242 clerks and 2,197 letter carriers. Of this number of clerks 2,678 were appointed to fill vacancies and 1,564 to new positions, while 1,361 carriers were appointed to fill vacancies and 836 to new positions. A readjustment of the service at a number of post offices during the year, including offices relegated to the third-class, enabled the department to effect reductions to the extent of 169 in the number of clerks, and of 42 in the carrier force.

The aggregate salaries of additional clerks appointed during the fiscal year amounted to approximately $497,400, and of the carriers

to $199,125. The saving resulting from the appointment of clerks at $600 to fill vacancies caused by separations from higher grades amounted to about $389,200 and the amount accruing from vacancies remaining unfilled temporarily and on account of deductions from the salaries of absent clerks was approximately $180,750.

Corresponding figures for the carrier service are $284,700 and $229,450, respectively. The increase in the annual rate of expenditure due to the payment for the entire year of the salaries of employees appointed for a portion of the preceding year was about $100,700 for clerks and $149,100 for carriers. A total of $1,713,800 was required for the annual promotions of clerks under the act of March 2, 1907, while the promotion of carriers cost $1,219,225. The expense involved in the promotion of supervisory employees in post offices during the year was $113,550. The net increase in the expenditure for clerk hire was $1,855,500, making the total expenditures $33,567,143, and for letter carriers $1,053,300, resulting in an aggregate cost of $32,791,366, including the expense of substitute, auxiliary, and temporary service.

The City Delivery Service was extended to 83 offices, for which 195 carriers, at an expense of $54,371, were allowed, and at the close of the fiscal year delivery service was in operation at 1,621 post offices.

During the last four fiscal years $15,813,900 have been expended in promotions for the employees of the first and second class post offices, which includes assistant postmasters, supervisory officers, clerks, letter carriers, and laborers, or subclerical employees. The number of these employees increased from 57,532 to 67,375, a net increase of 9,843. The following table shows the number of promotions and the amount expended therefor among the different classes of employees:

	Number of promotions.	Cost of promotions.
Assistant postmasters	1,797	$201,700
Supervisory employees	1,550	165,900
Clerks	73,526	8,547,800
Letter carriers	61,088	6,880,200
Laborers, watchmen, etc	183	18,300
Total	138,144	15,813,900

APPOINTMENT OF PRESIDENTIAL POSTMASTERS.

The fixed policy of recommending the reappointment of presidential postmasters who have rendered good service has been closely adhered to, while reappointments have been refused where the postmasters' records have been unsatisfactory. The fact that nearly 85 per cent of the postmasters whose commissions expired during the year were reappointed bears testimony to the efforts of such postmasters to maintain efficient service at their post offices, and thus to merit and receive the department's approval and indorsement. If presidential postmasters were included in the classified service still further improvement in the conduct of their offices would unquestionably result.

PERFORMANCE OF DUTIES BY POSTMASTERS.

The rule requiring presidential postmasters to devote at least eight hours daily to the conduct of their offices has come to be understood generally by postmasters, and its enforcement has contributed much toward the betterment of the service. Reappointments are sometimes denied solely on the ground of delinquency in this regard, and reappointment is recommended in such a case only on the written promise of the postmaster to comply with the requirements in the future. The department's insistence on full personal attention to their duties on the part of postmasters has undoubtedly been a potent factor in checking the tendency to ask for unnecessary increases in the clerical force in post offices and in making possible the reduction of the force in some cases, and has resulted in better management of the offices and improved service to the public.

EXTENSION OF THE CLASSIFIED SERVICE.

FOURTH-CLASS POSTMASTERS.

The strict observance for a number of years past of the policy of retaining fourth-class postmasters during good service paved the way for the partial classification of postmasters of this class in 1908, the classification at that time, however, extending only to postmasters in the 14 States lying east of the Mississippi River and north of the Ohio. Under date of October 15, last, the President completed the classification of postmasters of the fourth class by issuing an order bringing into the classified civil service all such postmasters in the United States, with the exception of those in Alaska, Guam, Hawaii, Porto Rico, and Samoa, in the manner outlined and recommended in the last annual report of the department. By the terms of the order the regulations were amended so as to provide that all appointments at offices where the compensation of the postmaster is $500 or more shall be made from a certification of three names instead of one as heretofore, and that where the compensation is less than $500 appointments shall be made on the recommendation of post-office inspectors, after personal investigation, in the manner heretofore prescribed for making appointments in the States of Massachusetts, New York, Ohio, and Illinois. Regulations governing the appointment of fourth-class postmasters, designed to carry out the terms of the President's order of October 15, were prepared by the Civil Service Commission, approved by the Postmaster General, and promulgated by the President under date of November 25.

The number of appointments of postmasters of the fourth class made on certification of the Civil Service Commission during the year was 830, the number for the preceding year having been 957. The number of postmasters in Massachusetts, New York, Ohio, and Illinois appointed on recommendation of post-office inspectors increased from 357 in 1911 to 408 in 1912.

ASSISTANT POSTMASTERS.

Under the Executive order of September 30, 1910, classifying the position of assistant postmaster at post offices of the first and second classes, about three-fourths of the persons holding the position at the

time the order was issued have been placed in the competitive classified service, and vacancies as they occur are filled by trained postal employees who have earned promotion by their work, thus providing for clerks and carriers an additional incentive for efficient service. Of the 271 vacancies that have occurred since the order was issued, 200 have been filled by the promotion of post-office clerks, 14 by the promotion of city carriers, 9 by transfer from the Railway Mail Service, 10 by transfer from other branches of the postal service, and 33 by selection from the eligible register.

SALARIES OF POSTMASTERS.

Attention has repeatedly been directed to the desirability of amending the present law under which the salaries of presidential postmasters are readjusted annually, to take effect on the 1st of July, on the basis of the gross receipts of the offices for the four quarters ended March 31. This leaves the department only three months in which to complete the readjustment of postmasters' salaries at more than 7,000 presidential offices. On this readjustment depend many of the allowances for operating expenses at these offices. If the law were amended so as to provide for readjusting the salaries on the basis of the gross receipts for the calendar year, to take effect at the beginning of the next fiscal year, the department would have six months in which to complete the computations on which the salaries are adjusted. The change would also simplify bookkeeping, since the four quarters on which the computations are now based are not the four quarters of either the fiscal or the calendar year. The increased revenue due to the operation of the new parcel post system and the consequent probable increase in the number of presidential post offices, furnishes an additional reason why this change should be made. The law governing the advancement of post offices of the fourth class to the presidential class should also be amended, as repeatedly recommended by the department, by providing that when the total compensation at a fourth-class office amounts to $1,000 for four consecutive quarters and the receipts for the same period to $1,900, the office shall then be advanced to the presidential class, irrespective of whether the compensation amounts to as much as $250 for each of the four consecutive quarters as under the present law. The offices that would be affected by this change are comparatively few in number and are mostly summer and winter resort offices where the business is confined largely to one or two quarters.

SALARIES OF ASSISTANT POSTMASTERS.

The maximum salary of an assistant postmaster at a post office of the first class is fixed by law at an amount not exceeding 50 per cent of the salary of the postmaster, graded in even hundreds of dollars. The annual appropriation acts, however, have provided for assistant postmasters at salaries ranging from $700 to $4,000 and it has been the policy of the department to grade their salaries at both first and second class offices at 50 per cent of the postmasters' salaries so far as the number of places provided in the appropriation act will permit. The $700, $800, and $900 grades have been assigned to the offices just advancing to the second class. In the last annual report atten-

tion was called to the inequalities that have arisen owing to the operation of the law providing for the annual promotion of clerks and carriers after one year's faithful and efficient service, in that the salaries of the clerks and carriers at a large number of offices had advanced beyond the salary of the assistant postmaster. However, the current appropriation act provided enough places for salaries of assistant postmasters and sufficient funds to enable the department to correct these inequalities, so that at the present time practically all assistant postmasters receive at least as much as their subordinates.

Now that the office of assistant postmaster is classified and practically all vacancies are filled by promotion from the office force it is desirable that the appropriations for assistant postmasters and for clerks in post offices be merged. This would not only simplify bookkeeping in the office of the Auditor for the Post Office Department, in the various post offices, and in this bureau, but would prevent a repetition of the anomalous condition that has heretofore arisen when the salary of the assistant postmaster is less than that of some of his subordinates. For instance in the case of an unusual growth of the service not anticipated at the time when estimates are prepared, resulting in the advancement in grade of a large number of post offices, the appropriation act probably would not provide sufficient places to enable the department to allow the proper salary for assistant postmasters.

OFFICIAL BONDS OF POSTMASTERS.

The regulations were amended within the past year so as to permit postmasters of the third and fourth classes to make use of bonding companies as sole surety. Since this change a large number of postmasters of these classes have availed themselves of the opportunity to file corporate bonds. Under the regulations as they now exist postmasters of all classes may use bonding companies as sole surety, and from the steadily increasing number of corporate bonds it is evident that it will not be long until the majority of all bonds filed are of this character. The general execution of corporate rather than individual bonds will be decidedly to the advantage of the department, inasmuch as in the case of corporate bonds no investigation as to their sufficiency is necessary, such as is required in the case of individual bonds, the responsibility of those surety companies that are acceptable on bonds of postmasters being readily ascertained from bulletins regularly issued by the Treasury Department. The furnishing of corporate bonds, furthermore, enables postmasters to avoid placing themselves under obligation to individual bondsmen and also makes it possible for them to file their bonds and receive their commissions without the delay frequently attendant upon securing persons willing and qualified to act as individual sureties.

An exceptionally large number of bonds have been required during the year on account of the extension of the Postal Savings System. While the bonds furnished by postmasters at offices designated as postal-savings depositories are required to cover the postal-savings business in addition to other postal duties, it has often been found unnecessary to call for a new bond on the designation of a post office as a depository, for the reason that all postmasters' bonds now contain a condition for the faithful performance of all duties and obligations in connection with the Postal Savings System, regardless of

whether or not the post office in connection with which the bond is executed has actually been designated as a depository. Heretofore several different forms of postmasters' bonds were employed to meet the department's requirements. A standard form of bond has recently been adopted, designed for either presidential or fourth-class postmasters, with either corporate or individual sureties, and for renewal as well as original. The adoption of a standard bond has safeguarded the Department against the omission of necessary conditions from blanks that are sent out for execution and has also resulted in no little economy in printing.

To facilitate the examination and approval of postmasters' bonds, card forms of powers of attorney have been required from the various bonding companies, showing the authority of every officer or agent authorized to execute bonds for such company, and these forms have been made accessible to the clerks who examine bonds. An index of all corporate bonds by companies is maintained, so that in case a company is no longer acceptable as surety the bonds executed by such company may be withdrawn for the purpose of securing their renewal with other surety.

NAVY MAIL SERVICE.

The mail service on board vessels of the Navy, established four years ago, has been reduced to a systematized basis notwithstanding the fact that the clerks employed necessarily perform their duties in foreign as well as American waters and are subject to the regulations of one department of the Government to be enforced largely by another department. On June 30 last there were 114 Navy mail clerks and 44 assistants, affording postal facilities to practically all vessels of the Navy. There were 64 changes in personnel during the year. The pamphlet of instructions for the guidance of Navy mail clerks, which was in course of preparation at the time of the last annual report, has since been published and issued to all employees of this service.

The appropriation act for 1913 contained provision for the designation of enlisted men of the Marine Corps, as well as those of the Navy, as Navy mail clerks and also for the execution by the clerks of bonds in such penalties as might be deemed sufficient by the Postmaster General. The purpose of the latter amendment was to permit increasing of bond penalties sufficiently to cover the value of stamps issued to such clerks.

SALARIES OF SUPERVISORY OFFICERS AND EXPERT DISTRIBUTERS.

Under the act of March 2, 1907, salaries of post-office clerks and city carriers are advanced annually for faithful and efficient service until the maximum grade of $1,000 at second-class offices and $1,100 at first-class offices is reached. The number of promotions to $1,100 at second-class offices and to $1,200 at first-class offices is governed by each appropriation act. The appropriation acts for 1910, 1911, and 1912 provided for the promotion of 50 per cent of the employees in these two grades. The current appropriation act, however, provides for the promotion of 75 per cent of the clerks and carriers in these two grades. At the present time, therefore, out of a total of 35,812 officers and clerks in first and second class post offices about

16,000 have reached the maximum grade of $1,200 at first-class offices and about 3,500 the maximum grade of $1,100 at second-class offices. Out of 30,300 carriers more than 17,400 have reached the $1,200 grade at first-class offices and 2,642 carriers have reached the $1,100 grade at second-class offices.

The officers who supervise the work of the clerks and letter carriers have not been promoted annually, as in the case of clerks, so that supervisory officers in many instances receive no more than the maximum pay of clerks and letter carriers, a condition that should be remedied. Substantial recognition should also be given to the expert distributers and experts in other lines of post-office work, such as issuing and paying money orders, handling of registered matter, keeping books, etc. For the purpose of promoting these supervisory officers and distributers the department has included in its estimate for the next fiscal year 2,075 promotions above the grade of $1,200.

THE NEW ORGANIZATION OF POST OFFICES.

The reorganization of the clerical forces of the larger post offices into two divisions on the plan outlined in reports of this bureau for previous years, has been continued wherever conditions are such as to make it feasible. Improvement in efficiency and discipline with consequent economy of management has resulted, and where the plan has been put in operation completely it is estimated that a saving of 6 per cent in the total number of employees has been effected.

CLERICAL AND CARRIER FORCES.

During the last fiscal year 14,203 clerks and 10,397 letter carriers were advanced one grade in salary. In the grades between $600 and $1,000 at second-class offices and between $600 and $1,100 at first-class offices, 9,487 clerks and 7,297 letter carriers were promoted. At the second-class offices 788 clerks and 697 carriers were promoted from $1,000 to $1,100, and at the first-class offices 3,928 clerks and 2,403 carriers were promoted from $1,100 to $1,200. The total increase in the annual rate of expenditure by reason of these promotions was $1,616,700 for clerks and $1,188,800 for carriers. No promotions were withheld except for unsatisfactory service, the percentage of employees failing of promotion being very small. This fact and the fact that only 342, or about one-half of 1 per cent of the entire number of clerks and carriers, were removed during the last fiscal year attest the high character of the clerical and carrier forces. The average salary of clerks increased from $1,028.22 in 1911 to $1,041.99 in 1912, and of letter carriers from $1,069.04 to $1,080.22. In 1901 the average salary of post-office clerks was $773.11 and letter carriers $903.

Of the 2,674 vacancies that occurred in the clerical force, 1,369 were caused by resignations, 193 by deaths, 175 by removals, 148 by promotion to the position of assistant postmaster, 402 by transfer to other branches of the service, and 391 on account of unsatisfactory service during their probationary period or on account of disability. The changes from all causes represent 7.93 per cent of the total number, the resignations 4.06 per cent, and the number removed only 0.52 per cent.

Of the 1,361 vacancies that occurred in the letter carrier force, 502 were caused by resignations, 167 by removals, 186 by deaths, 26 dropped on account of unsatisfactory service during their probationary period or on account of disability, 470 transferred to the clerical force, and 10 were transferred to other branches of the service. It will be noted that the vacancies from all causes represent 4.54 per cent of the entire number, the separations from the service by resignation 1.68 per cent, and the number removed only 0.56 per cent.

SUBSTITUTE EMPLOYEES.

As has been pointed out in former annual reports, there is urgent need for making the position of substitute clerks and carriers more attractive. It is necessary to have a relatively large force of substitutes available to take the place of regular clerks and carriers absent on account of sickness, and other causes, as well as to assist on days when mails are unusually heavy. A substitute's pay is at the rate of 30 cents an hour for the time actually employed, but their service is not continuous and in consequence their earnings are small. In order that each may have as much work as possible the number on the active list is kept at a minimum, and although only a restricted number of substitutes are required to report at the office daily or to hold themselves in readiness to respond to calls for duty, they can not be assured of a full day's work or of work every day, and moreover such service as is required of them may prevent their obtaining outside employment.

While the new parcel-post system and the eight-hour law will increase the amount of work for substitutes and add materially to their earnings, and perhaps shorten the period of substitute service, an increase in the entrance salary would do more to improve the condition of the substitute employees than any other plan suggested.

HIGHER ENTRANCE SALARY.

Under the present law the initial salary for clerks and carriers is $600 per annum. Taking into consideration the long period of substitute service and the high cost of living it is believed that this salary ought to be increased from $600 to $800. If this were done the resulting improvement in personnel would probably offset the additional expenditures—estimated at $1,250,000 for both clerks and carriers.

Notwithstanding the very large sums paid out during the last few years for promotions, under the act of March 2, 1907, the relative cost of the service has been reduced, thus proving that higher wages and an improved personnel result in true economy.

RELIEF FROM SUNDAY AND HOLIDAY SERVICE.

In the last annual report reference was made to the action of the department in curtailing service on Sunday on the part of post-office employees and allowing them one day's rest in seven. Congress recognized the justice of this principle and at its last session enacted a law reading as follows:

> That hereafter post offices of the first and second classes shall not be open on Sundays for the purpose of delivering mail to the general public, but this provision shall not prevent the prompt delivery of special delivery mail.

And providing further after March 4, 1913.—

That should the needs of the service require the employment on Sunday of letter carriers in the City Delivery Service and clerks in first and second class post offices, the employees who are required and ordered to perform Sunday work shall be allowed compensatory time on one of the six days following the Sunday on which they perform such service.

At a large majority of first and second class post offices, mails are received and dispatched on Sunday, and therefore such offices must be kept open part of the day at least for this purpose. The department therefore has directed postmasters to deliver ordinary as well as special delivery mail during such hours as offices are open on Sunday, so as to inconvenience the public as little as possible consistent with a proper observance of the law. Of course, at offices where no mails are received and dispatched on Sunday, no deliveries of ordinary mail can be made.

The application of the law directing that after March 4, 1913, employees who are required to work on Sunday shall be allowed compensatory time on one of the six days following the Sunday on which they perform such service will add considerably to the cost of the service. Heretofore it has been the practice to allow compensatory time for Sunday service during the seasons of the year when mails are light.

During the past year, in some cities where public sentiment has favored it, postmasters have been authorized to omit delivery of mail by carriers on certain holidays when mails are light, such as Independence Day, Labor Day, and Thanksgiving Day. This necessarily results in congestion on the day following due to the unusual accumulation of the mail, but under the operation of the 48-hour law it has been possible as a rule for the regular force of carriers to dispose of this mail without undue delay and without added expense. Under the new law limiting the service of employees to 8 hours in 10 it is doubtful whether this can be done without additional cost either for overtime or auxiliary carriers.

ANNUAL VACATIONS.

Employees in nearly all other branches of the service are allowed 30 days' annual leave with pay, and in case of serious illness may be granted 30 days' additional leave with pay, while under existing law post-office clerks and carriers are granted only 15 days, with no provision for additional leave in the event of sickness and accident, even though the disability be incurred in the line of duty. Although Sunday work has been largely eliminated and compensatory leave is granted for necessary service on that day, the conditions of employment of post-office clerks are far from ideal. In many offices the workrooms are crowded, the light and ventilation insufficient, notwithstanding the efforts of the department to improve these conditions. A considerable proportion of the clerks and a much smaller proportion of the carriers are necessarily required to work at night. In the case of clerks engaged in distribution, study after office hours is necessary to memorize schemes. Carriers are exposed to the inclemency of the weather, but in other respects their employment is especially healthful.

With the application of the new eight-hour law it will not be possible to the same extent as formerly to adjust schedules and routes of clerks and carriers during the vacation season when the mails are

light so that the work of absent employees may be done in part by those on duty, and the cost of vacation service will be greater than heretofore. It is estimated that the cost of vacation service with 15 days' annual leave during the next fiscal year will be $225,000 for clerks and $973,860 for carriers, and to allow 30 days' leave with pay will probably require an additional appropriation of $225,000 for clerks and $900,000 for carriers. Nevertheless, it is believed the expenditure of these large sums of money would be justified, and that the additional outlay would be returned to the Government in the increased efficiency of the employees.

NEW EIGHT-HOUR LAW.

The postal act approved August 24, 1912, contains the following provision:

> That on and after March fourth, nineteen hundred and thirteen, letter carriers in the City Delivery Service and clerks in first and second class post offices shall be required to work not more than eight hours a day: *Provided*, That the eight hours of service shall not extend over a longer period than ten consecutive hours, and the schedules of duty of the employees shall be regulated accordingly.
>
> That in cases of emergency, or if the needs of the service require, letter carriers in the City Delivery Service and clerks in first and second class post offices can be required to work in excess of eight hours a day, and for such additional services they shall be paid extra in proportion to their salaries as fixed by law.

It is apparent that a general readjustment of work in post offices must be made to bring the eight-hour service in all cases within the prescribed period. More than 60,000 clerks and carriers will be affected by the new law, and in many offices conditions are such, due to the time of arrival of mails, the late running of trains, and other local causes, that it will be difficult to arrange schedules so that 8 hours' profitable employment within 10 consecutive hours can be assigned to clerks and carriers.

As it is not advisable to employ clerks and carriers overtime unless absolutely necessary, an auxiliary force will be organized for daily service at many offices to supplement the regular force. These temporary and auxiliary clerks and carriers will be paid at the rate of 30 cents an hour. It is hoped that the increased efficiency that will result from the benefit to the employees of fixed schedules, avoidance of overtime, and compensatory time for service on Sunday will offset the increase in expenditures.

EFFICIENCY RECORDS.

A proper system of rating efficiency is absolutely necessary if advancement in grade and rank is to be based solely on merit. The present system of rating efficiency in the post-office service was put into operation on July 1, 1909, and has proved fairly satisfactory when impartially administered. Section 4 of the act of August 23, 1912, making appropriations for the legislative, executive, and judicial expenses of the Government, provides that the Civil Service Commission shall, subject to the approval of the President, establish a system of efficiency ratings for the classified service in the executive departments in Washington. Undoubtedly a uniform system throughout the entire civil service is desirable, and the plan in operation in the post-office service should be modified to harmonize with the methods adopted by the Civil Service Commission when approved by the President.

INJURED AND SUPERANNUATED EMPLOYEES.

In the postal service the employees rarely are able to accumulate savings, and the injury of an employee in the line of duty, necessitating his absence without pay or resulting in death, is a serious hardship to his family. The Government should take the lead in dealing fairly with employees who are injured while in the performance of duty, and those who, when burdened with years and worn with faithful service, are forced to relinquish their positions because no longer able to work.

LABOR-SAVING DEVICES.

During the last fiscal year $48,933.78 of the appropriation of $50,000 for the purchase, repair, and maintenance of mechanical and labor-saving devices was expended as follows:

Conveyors and carriers	$7,355.50
Pick-up tables	24,800.00
Remodeling pick-up tables in the Chicago post office	10,320.00
Power	3,750.00
Material and supplies	2,294.29
Repairs	413.99
Total	48,933.78

The machine facing tables, or patent pick-up tables, as they are called, manufactured by the B. F. Cummins Co., of Chicago, have proved a success. Reports from all the post offices in which they are used show that on an average the efficiency of the men engaged in facing mail has increased 36 per cent. As the clerks become more proficient in the use of the table better results are obtained, and it is not improbable that the increase in efficiency will amount to as much as 50 per cent. This increase in efficiency is not the only advantage accruing to the service from the use of these machine tables. The dispatch of mail is greatly facilitated, since it starts to move the minute the operation of facing begins. The advantages derived from the use of these machines are shown in the following extracts from reports on file in the department.

The postmaster of Atlanta, Ga., in a report dated October 31, 1911, states:

> The outgoing mails are now being dispatched with a promptness and celerity heretofore unknown.

The postmaster of Cleveland, Ohio, in a letter dated October 16, 1911, makes the following comments:

> By the continuous use of the new tables we are enabled to more nearly dispose of mail matter in the order received than by any previous arrangement tried. This is accomplished by requiring the two tables to be filled alternately from the collections, no late collections to be deposited on the first table filled until all of the original deposit is disposed of. This was impossible under the old arrangement, and has resulted in seldom receiving a complaint of delayed postmarking and dispatching of business mail, which previously was quite frequent.

The superintendent of mails at Memphis, Tenn., reports under date of December 28, 1912, that—

> Since the installation of the Cummins pick-up table we are able to get up our mails from one and one-half to two hours earlier than formerly. We used to complete our distribution of mail about 9 to 10 p. m., while now we clean up all the primary cases at 8 p. m.

A foreman in the Minneapolis post office, in a letter dated November 10, 1911, makes the following comments:

> The most important and noticeable result of this increase of speed is shown in the remarkably short space of time which elapses from the time the mail is deposited on the facing table until it reaches the final case of dispatch. Thus a more expeditious dispatch of mail is secured by the use of the new device.

The superintendent of mails in the Nashville (Tenn.) post office, under date of December 14, 1912, writes as follows:

> Prior to the inauguration of the Cummins pick-up table first-class mail was congested from 6.20 to 9 p. m., and we were unable to dispatch all mail on the early evening trains, the amount missing dispatch frequently being 14 canvas bags full. Since the inauguration of the pick-up table mail brought in the office as late as 7.10 p. m. is dispatched to the West at 7.35 p. m.

The postmaster of New York stated, in a letter dated October 3, 1912, with reference to the tables placed in the Hudson Terminal Station of his office, that—

> The amount of mail received in the collections during the quarter beginning July 1, 1912, as compared with the same period in 1911 shows that while the number of letters handled has greatly increased, the number of employees used for the purpose of facing the same and the amount of money expended have decreased, notwithstanding the fact that when the pick-up tables were originally installed one more ordinary facing table was regularly used than is now necessary.

During the current fiscal year four vertical distributing cases were purchased and assigned—three to the Chicago (Ill.) post office and one to the Kansas City (Kans.) post office. These distributing cases are intended to take the place of the old-style bag racks; and, while they are much more expensive than the bag racks, they will undoubtedly prove their value, since it is estimated that the saving in clerk hire the first year will more than equal their initial cost. The cases are built of steel and will last many years.

A combined facing and canceling machine was exhibited recently in the Washington office. This device, when it is perfected, bids fair to supplant the more expensive machine tables; and, owing to its simplicity, it can probably be furnished to the Government on a rental basis at a very low price. It has a device for automatically separating long from short letters, thereby making it possible to more than double the speed of the men engaged in facing mail. Other inventors are endeavoring to perfect machine distributing cases for letter mail. It is claimed for one of these devices that it will not only postmark and cancel stamps, but will enable one operator to perform the work of several distributors.

The utilization of labor-saving machinery in the postal service is becoming more necessary each year, since the wages of the employees are constantly increasing, and the new eight-hour law will add largely to the expenditures.

CANCELING MACHINES.

The current three-year contracts for the rental of canceling machines will expire on June 30, 1913. The appropriation act for 1912 authorized the Postmaster General to enter into contracts for the rental of canceling machines for a term of four years instead of three, and in order that full competition might be secured and that all companies might bid on equal terms and have ample time in which

to construct new machines in the event that their proposals were accepted, advertisements were issued through the office of the purchasing agent on July 24, 1911, calling for proposals for the rental of canceling machines for the four-year term beginning July 1, 1913, and for the sale of machines. The proposals in response to this advertisement were opened on October 31, 1911, by a committee of three appointed for that purpose. A protest was entered by three of the competing companies against the consideration of one of the bids on the ground that it was not responsive to the specifications. This question was referred to the Assistant Attorney General for the Post Office Department, who decided that the protested bid was not responsive to the advertisement and therefore could not be considered. Meanwhile the committee appointed to open the bids and to make a report to the Postmaster General recommended, December 15, 1911, that authority be granted it to make a thorough investigation of the canceling machine question and to conduct tests to determine the proper course to pursue with reference to making new contracts. On the recommendation of this bureau the committee was enlarged on December 19, 1911, by adding two members, and its authority was extended as suggested. On February 20, 1912, the committee reported that tests to determine the relative efficiency of the different makes of machines had been made, and that the machines offered by the company whose proposal had been rejected, in accordance with the ruling of the law officer of the department, showed sufficient merit to warrant the department in readvertising.

Accordingly, all bids received in response to the advertisement of July 24, 1911, were rejected and new proposals were called for by advertisement on February 20, 1912. These proposals were opened on March 20, 1912. Pests of the various machines offered were made in Washington, New York, Boston, and Chicago during the month of April, 1912. On May 2, 1912, however, the appropriation bill passed the House of Representatives containing a provision that "hereafter no contract shall be made for any canceling machine for more than $270 per annum." The company which furnishes a majority of the rapid automatic machines used in the service had submitted a proposal for its machines at a rental in excess of this maximum rate fixed by the House of Representatives, and consequently the committee was compelled to await the final action of Congress before recommending an award. While the bill was under consideration in the Senate the department strongly recommended to the Senate committee that the House provision limiting the rental price of canceling machines to $270 per annum be eliminated, and pointed out the disastrous effect on the service that would result should this provision remain in the bill, and the department be forced to discontinue, on July 1, 1913, the use of the large number of high-grade machines for which the contractor demanded more than $270 per annum. However, the appropriation bill as finally enacted on August 24, 1912, retained the limitation clause, and the canceling machine committee made its report under date of August 31, 1912. On August 5, 1912, the chairman of the House Committee on Expenditures in the Post Office Department notified the department that the committee had passed a resolution requesting that no further orders be given for canceling machines until the committee could investigate the making of awards. This resolution was modified by

another resolution of the committee on August 15, 1912, "That the Postmaster General be requested to direct that no further orders be given for canceling machines in the Post Office Department except such as are necessary for the immediate requirements of the service until the committee can investigate the making of awards, etc."

The canceling machine committee submitted a special report, under date of June 7, 1912, recommending the purchase of 55 canceling machines of a new type, operated either by hand or electric power, at $184 each. Up to this time the department had purchased only hand-power canceling machines, the last purchase having been made in July, 1910, of 100 machines, at $275 each. This new type of machine embodied not only all of the advantages of a machine driven by electric power, but is readily and easily converted into a hand-power machine. Tests made by the committee showed this new model to be the equal of any machine ever purchased, and the price was lower than that of any other machine offered for sale under the advertisement of February 20, 1912, or, in fact, ever offered to the department. The recommendation of the committee was approved and the purchase ordered under date of June 18, 1912, there being at that time an available balance in the appropriation for canceling machines for 1912 sufficient to pay for the machines. After the purchase had been made it was decided to equip all of these machines with electric motors, which were purchased for $14 each. Consequently, for $198 each the department has secured 55 machines, which are superior in many respects to some of the machines for which $150 per annum rental has been paid.

The following statement shows the number of machines in the service on June 30, 1910, the annual rate for each machine, and the total annual rental; the minimum number of machines specified in the three-year contract beginning July 1, 1910, the annual rate for each machine, the number actually in the service on December 1, 1912, and the total annual rental:

Name of company and model of machine.	Machines in the service June 30, 1910.			Minimum number of machines specified in 1910–1913 contract.		Machines under rental Dec. 1, 1912.	
	Number.	Rate per annum.	Total annual rental.	Number.	Annual rate per machine.	Number.	Total annual rental.
International Postal Supply Co.:							
Hey-Dolphin Flier	243	$400	$97,200	285	$300	283	$84,900
Model "S"	102	150	15,300	88	150	105	15,750
Model "L"	186	90	16,740	100	80	170	13,600
American Postal Machines Co.:							
Stoddard	23	225	5,175	25	225	41	9,225
Combination	433	150	64,950	400	135	399	53,865
Drop-feed	265	100	26,500	266	90	226	20,340
Hand-power No. 1	340	80	27,200	200	72	368	26,496
Hand-power No. 2	10	60	600	10	54	17	918
Time-Marking Machine Co.: "Cummins"	59	300	17,700	85	270	131	35,370
Columbia Postal Supply Co.: Columbia	62	150	9,300	75	110	81	8,910
Universal Stamping Machine Co.: Universal	25	150	3,750	25	150	59	8,850
Total	1,748	.....	284,415	.....	.....	1,880	278,224

PARCEL POST.

During the past year experiments have been made at a number of offices to ascertain the feasibility of delivering the heavy and bulky mail of the second, third, and fourth classes by using conveyances on special trips for the delivery of such mail only, thereby relieving the carriers in districts where the volume of mail of this character is large and effecting earlier delivery of letter mail and daily papers. It was found that carriers when relieved of the package mail usually carried on their first trip were able to complete their deliveries from 15 to 30 minutes earlier than when handling all classes of mail. At the office where the most comprehensive test was made it was found that 12 contiguous routes in a thickly settled residence section could be so operated as to have the regular force perform all of the service and make an exclusive package delivery with the aid of two horses and carts, so that the only additional expense was for the hire of the vehicles. This experiment demonstrated the practicability of delivering parcel-post matter by supplementing the regular facilities with such equipment for handling the larger and heavier packages as the volume of business requires and of considerably facilitating the first morning delivery of letter mail.

The new parcel-post system, increasing the limit of weight and reducing the postage on matter of the fourth class, will greatly increase the volume of the mail and will necessitate a larger force and additional equipment. It is the purpose of the department, however, to utilize existing facilities to the greatest possible extent, and to employ additional men only when absolutely necessary to effect prompt deliveries of parcels. The increase in the carrier force will undoubtedly improve the city delivery service and will result in earlier and more frequent deliveries of first-class mail matter.

STREET LETTER BOXES.

The department has been endeavoring for some time to bring about the much-needed improvement of street letter boxes. The design which has been in use for many years is not ornamental and the opening for removing the mail is small and so constructed as to cause unnecessary delay in making collections. The boxes are so unattractive that in some cities postmasters have been requested, if not required, to remove them from boulevards, avenues, and streets on which the letter boxes and posts are out of harmony with the ornate electric-light posts and fire-alarm and police-telephone posts.

A committee was appointed on January 4, 1911, to make a thorough investigation of the question, solicit proposals from inventors, and test the various devices offered. As a result of this investigation the committee recommended the adoption of a box designed for the rapid collection of mail with light motor vehicles, the door and bottom of the box being hinged and adjusted so that when the door is open the bottom may be depressed and thus with the door form a chute at such an angle that the contents are dumped by their own weight into the mail receptacle on the motor car or into the carrier's satchel. Another style recommended is provided with a lining in the back and bottom so curved as to throw the contents to the front of the box, so that upon opening the door the removal of the mail by the collector requires only a few seconds. Both of these boxes are constructed so

that the collector can easily see that no mail is left in them, and it is believed that their use will save one-half or two-thirds of the time now consumed in removing the mail. The designs are neat, pleasing in appearance, and not so ornate as to be too expensive. They will harmonize with the present-day improvements of streets and avenues and will reflect credit on the postal service. To secure the fullest advantage from the use of the new-style boxes, it is proposed to place them first in sections of the large cities where collections are heaviest and where the greatest saving of time may be effected.

To provide a more ornamental letter box for public buildings, hotels, and special localities, a design has been approved that is imposing, yet simple and dignified. This box will be furnished at private expense subject to the approval of the department.

PRIVATE MAIL RECEPTACLES.

A considerable portion of city carriers' time is consumed awaiting answers to rings at door bells while on delivery trips, an unnecessary waste of time that could be avoided if patrons were required to provide suitable receptacles for the deposit of mail matter as a condition to the free delivery of their mail. This would also obviate the necessity for the patrons' responding to the carriers' calls at inconvenient moments and permit the delivery of mail in the temporary absence of members of the household. Likewise carriers would not be compelled to return to the post office undelivered mail when the patron is temporarily absent from his home or fails to respond within a reasonable time to the carrier's ring.

It is now the policy of the department not to establish new service or to extend service to new territory until patrons have provided suitable receptacles for the receipt of their mail. In a number of smaller cities where postmasters have been successful in inducing their patrons to provide receptacles for mail matter at the doors of their residences and places of business, the time of one or more carriers has been saved, and this time has been utilized in making more frequent deliveries and in extending the service without additional cost to the department.

MOTOR VEHICLES DELIVERY AND COLLECTION SERVICE.

AUTOMOBILES.

Automobiles under contract were used during the past year for the delivery and collection of mail and the transportation of carriers with mail to their routes at Atlantic City, N. J.; Cleveland, Ohio; Indianapolis, Ind.· Milwaukee, Wis.; Philadelphia, Pa.; Toledo, Ohio; and Washington, D. C., and contracts for service beginning in the current year have been entered into at Rochester, N. Y., and St. Louis, Mo. In 21 cities carriers use automobiles for the delivery and collection of mail under annual allowances.

The use of the motor vehicles at present is secured in two ways: (1) Under annual allowances for furnishing machines to be operated by carrier; (2) by contracting for machines with chauffeurs. The machines furnished by carriers are for the most part light automobiles and are utilized mainly in the delivery service and in making collections during the day, while the machines contracted for are of heavier type and are utilized principally for making collections in the early evening and during the night. In most instances one carrier with an auto-

mobile is doing the work of two carriers, and, in some instances, of three carriers, with horse-drawn vehicles.

It is believed that further improvement of the collection service in the larger cities will be most economically and effectively accomplished by the use of foot men in congested districts, where the volume of traffic is large, and light-running motor vehicles in residence, manufacturing, and outlying districts, the mail to be deposited in storage boxes located at convenient points on main thoroughfares, from which it is taken to the post office by automobiles of heavier type and larger capacity. The possibilities of such a system are shown by the following-described service which is now in operation in Indianapolis, Ind.:

Foot men are utilized in the congested districts who open boxes in buildings and on side streets and deposit collections therefrom in tie sacks placed in package boxes conveniently located on main thoroughfares, and the autos in turn collect from the latter by removing tie sacks and replacing them with empty tie sacks. This procedure is continued from about 5.30 p. m. until about 6.45 p. m., when practically all mail from the congested district is in the office. During the time autos are engaged in above collections, several carriers with carts are collecting from boxes in the residence and manufacturing districts on unimproved streets, and the mail therefrom is deposited in package boxes on improved streets, from whence it is transported to the main office by autos, thereby advancing dispatch of this class of mail from one to two hours. Automobiles continue collections until all boxes in residence districts have been emptied.

MOTOR TRICYCLES.

The need for a light and speedy vehicle for use in the collection of mail in residential and suburban territory has long been recognized. During the last year experiments have been conducted in collecting mail in selected territory by means of motor tricycles operated by a city letter carrier. The motor tricycle was equipped with a box or receptacle into which the mail could be dumped from a drop-bottom street letter box by the carrier without dismounting from the machine. The experiment demonstrated that a collector mounted on one of these machines can perform the work of three foot collectors where the boxes are not more than two blocks apart and within a reasonable distance of the central post office or station. A greater economy, of course, can be shown where the collection route is farther removed from the post office, owing to the speed with which the mail can be conveyed from the end of the route to the post office. Where these light motor vehicles have been used instead of horses and carts it has been demonstrated that each machine can do the work of two horses and carts, thus saving the salary of one carrier. It is probable that contracts will be entered into at an early date for vehicles of this kind to be furnished in a number of the larger cities, where the weather and the condition of the streets will permit their efficient operation.

VILLAGE FREE DELIVERY.

Attention was called in the last annual report to the question of extending the free delivery service to the residents of towns and villages that can not be included under existing law either in the city delivery service or in territory served by rural letter carriers. As a result of the department's recommendation Congress provided the sum of $100,000 for the establishment of an experimental mail delivery service in towns and villages having post offices of the second and third classes that are not now entitled by law to free delivery

service, provided that not exceeding $1,800 may be expended at any one office. The act of Congress was approved on August 24, 1912, and steps were taken immediately to start this experimental service in all sections of the country, the plan being to have the inspector in charge of each of the fifteen divisions select an office in the territory under his jurisdiction at which to establish the new service. In order that the experiment might be conducted under varying conditions authority was delegated to the inspector in charge of each division to formulate the rules and regulations under which the service should be conducted.

A number of applications have been received for the establishment of village delivery, and investigations are being made to determine which offices are best adapted for the experiment. Twenty-nine post offices so far in as many different States have been designated for the experimental service, and in eight post offices the new service has been in operation a month or more.

However, it is too early in the experiment to state any mature conclusions as to the best method of applying delivery service in towns and villages. That it will prove expensive is evident, and whether the resulting benefits to the people will justify the expense is a question that can be determined in another year.

STANDARDIZATION OF POST-OFFICE FURNITURE AND FIXTURES.

The standardization during the year of all equipment and furniture used in post offices, except that used in a few of the very large offices, where the work is so highly specialized that special equipment is necessary, has been accomplished through the joint labors of committees from this department and the Treasury Department. Heretofore in selecting furniture it has been the practice, especially in the case of post offices located in Federal buildings, to depend largely on the wishes and judgment of the postmasters, with the result that there were almost as many different kinds of equipment as there were post offices to be equipped. With the standardized equipment the same class of furniture, as regards dimensions, construction, and finish, will be supplied to all offices where the requirements are identical. This equipment is built, as far as possible, on the unit system and can be indefinitely extended to meet the increasing demands of the service by the introduction of new units wherever necessary.

A MODEL POST-OFFICE BUILDING.

The new St. Louis post office is an example of what can be accomplished where post offices are properly located with reference to transportation facilities and where the interior arrangement of the furniture and equipment is placed under the jurisdiction of the Post Office Department. This office, which has just been occupied, adjoins the Union Railroad Station, where all mails are received and dispatched. It is completely equipped with mechanical devices for the economical and rapid handling of mail matter.

The new New York uptown post office is similarly located with reference to the Pennsylvania Railroad Terminal Station. Contracts have been let for a complete system of belt and tray conveyers and other mechanical devices. Like the St. Louis office, the mails will be handled in one large room, free from pillars and other obstructions, with ample natural light and a modern system of ventilation.

APPROPRIATIONS AND EXPENDITURES.

The following table shows the amounts appropriated under the several heads, the amounts expended, and the unexpended balances:

Item.	Appropriation.	Expenditure.	Balance.
Compensation to postmasters	$29,300,000	$28,643,824.15	$656,175.85
Compensation to assistant postmasters, first and second class offices	2,800,000	2,775,083.45	24,916.55
Compensation to clerks at first and second class offices	35,900,000	35,567,143.47	332,856.53
Compensation to printers, mechanics, and skilled laborers	44,600	39,201.16	5,398.84
Compensation to watchmen, messengers, and laborers	900,000	860,733.86	39,266.14
Compensation to clerks in charge of contract stations, at a rate not to exceed $300 each	600,000	559,427.22	40,572.78
Compensation to clerks in charge of contract stations, at a rate above $300 each	330,000	292,335.87	37,664.13
Compensation to substitutes for clerks on vacation at first and second class offices	125,000	106,466.20	18,533.80
Temporary and auxiliary clerk hire at first and second class offices	250,000	237,629.65	12,370.35
Separating mails at third and fourth class offices	700,000	647,616.49	52,383.51
Unusual conditions at post offices	140,000	99,557.11	40,442.89
Clerks, third-class offices, compensation of postmaster $1,000 to $1,500	580,000	559,596.64	20,403.36
Clerks, third-class offices, compensation of postmaster $1,600 to $1,900	750,000	720,605.13	29,394.87
Rent, light, and fuel at first, second, and third class offices	4,400,000	4,248,384.13	151,615.87
Miscellaneous items, first and second class offices	325,000	306,515.77	18,484.23
Rental and purchase of canceling machines	310,000	293,595.21	16,404.79
Purchase, repair, and maintenance of mechanical and labor-saving devices	50,000	45,419.86	4,580.14
Incidental expenses of City Delivery Service	35,000	30,549.33	4,450.67
Pay of carriers at offices already established	32,180,000	31,724,222.09	455,777.91
Pay of substitute, auxiliary, and temporary letter carriers	1,100,000	1,012,772.95	87,227.05
Pay of carriers at offices established during year	75,000	54,371.30	20,628.70
Horse-hire allowance and rental of vehicles	925,000	879,683.14	45,316.86
Car fare and bicycle allowance	475,000	435,678.96	39,321.04
Street car collection service	10,000	8,740.00	1,260.00
Detroit River postal service	6,500	6,500.00	.....
Car fare for special-delivery messengers	13,000	10,304.93	2,695.07
Fees to special-delivery messengers	1,400,000	1,469,177.80	[1] 69,177.80
Travel and miscellaneous expenses	1,000	516.03	483.97
Total	113,725,100	111,635,651.90	2,089,448.10

[1] Deficit.

The following tables show the estimates, the appropriations, and the expenditures under the several heads for each fiscal year from 1903 to 1912, inclusive, the estimates and appropriations for the fiscal year 1913, and the estimates for the fiscal year 1914.

COMPENSATION TO POSTMASTERS.

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1903	$20,000,000	$20,974,775.97	$987,724.78	4.94	$21,631,724.04	$847,804.07	4.08
1904	21,500,000	21,739,169.57	764,393.60	3.60	22,273,343.90	641,619.86	2.97
1905	24,000,000	23,250,000.00	1,510,830.43	6.95	22,745,348.01	472,004.11	2.12
1906	23,750,000	23,750,000.00	500,000.00	2.15	23,549,508.35	804,160.34	3.54
1907	24,500,000	24,000,000.00	250,000.00	1.05	24,578,195.46	1,028,687.11	4.37
1908	25,500,000	25,500,000.00	1,500,000.00	6.25	25,596,576.36	1,018,380.90	4.14
1909	26,250,000	26,254,000.00	754,000.00	2.96	26,563,372.43	966,796.07	3.78
1910	27,000,000	27,000,000.00	746,000.00	2.84	27,523,022.98	959,650.55	3.61
1911	27,900,000	27,900,000.00	900,000.00	3.33	28,292,334.72	769,311.74	2.79
1912	29,000,000	29,300,000.00	1,400,000.00	5.02	28,643,824.15	351,489.43	1.24
1913	30,200,000	30,000,000.00	700,000.00	2.39	.....	.....	.....
1914	30,250,000	.....	.....	.....	.....	.....	.....

COMPENSATION TO ASSISTANT POSTMASTERS AT FIRST AND SECOND CLASS POST OFFICES.

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1903	$1,701,500	$1,701,500.00	$142,200.00	9.12	$1,624,730.12	$145,056.07	9.80
1904	1,894,100	1,894,100.00	192,600.00	11.32	1,809,642.24	184,912.12	11.38
1905	2,000,000	2,037,800.00	143,700.00	7.59	1,895,413.55	85,771.31	4.74
1906	2,154,300	2,123,800.00	86,000.00	4.22	1,978,774.76	83,361.21	4.40
1907	2,123,800	2,123,800.00	.....	.....	2,110,001.81	131,227.05	6.63
1908	2,275,000	2,336,800.00	213,000.00	10.03	2,290,851.76	180,849.95	8.57
1909	2,600,000	2,500,000.00	163,200.00	6.99	2,441,140.17	150,288.41	6.56
1910	2,620,000	2,620,000.00	120,000.00	4.80	2,539,216.30	98,076.13	4.02
1911	2,700,000	2,700,000.00	80,000.00	3.05	2,678,782.05	139,565.75	5.50
1912	2,880,000	2,800,000.00	100,000.00	3.70	2,775,083.45	96,301.40	3.59
1913	3,000,000	3,000,000.00	200,000.00	7.14	.....	.....	.....
1914	3,075,000	.....	.....	.....	.....	.....	.....

COMPENSATION TO CLERKS AT FIRST AND SECOND CLASS POST OFFICES.

1903	$14,878,200	[1] $15,715,024.03	$2,663,375.22	20.41	$15,736,046.42	$2,571,238.44	19.53
1904	18,101,900	[2] 18,124,730.43	2,409,706.40	15.26	17,792,789.74	2,056,743.32	13.06
1905	[3] 20,000,000	19,995,700.00	1,870,969.57	10.32	19,658,199.49	1,865,409.75	10.48
1906	21,630,500	21,060,000.00	1,064,300.00	5.32	21,037,113.17	1,378,913.68	7.01
1907	22,680,000	[4] 22,820,000.00	1,760,000.00	8.36	22,074,761.72	1,037,648.55	4.93
1908	25,700,000	[5] 27,020,200.00	4,200,200.00	18.89	25,994,375.39	3,919,613.67	17.75
1909	[6] 31,240,000	28,726,500.00	[6] 3,192,100.00	11.81	28,669,899.50	2,675,524.11	10.29
1910	32,000,000	31,908,500.00	3,182,000.00	11.08	31,586,937.93	2,917,038.43	10.17
1911	34,700,000	33,900,000.00	1,991,500.00	6.24	33,719,768.08	2,132,830.15	6.76
1912	36,130,100	35,900,000.00	2,000,000.00	5.90	35,567,143.47	1,847,375.39	5.47
1913	37,700,000	37,878,000.00	1,978,000.00	5.51	.....	.....	.....
1914	40,125,000	.....	.....	.....	.....	.....	.....

COMPENSATION TO SUBSTITUTES FOR CLERKS, AT FIRST AND SECOND CLASS POST OFFICES, ON VACATION.

1903	$200,000	$175,000.00	$25,000.00	16.67	$158,834.44	$13,556.53	9.33
1904	200,000	200,000.00	25,000.00	14.29	157,148.48	[8] 1,685.96	[8] 1.06
1905	[7]	100,000.00	[8] 100,000.00	[8] 50.00	58,535.20	[8] 98,613.28	[8] 62.75
1906	100,000	100,000.00	.....	.....	85,934.88	27,399.68	46.81
1907	100,000	100,000.00	.....	.....	84,099.05	[8] 1,835.83	[8] 2.13
1908	110,000	[9] 110,000.00	10,000.00	10.00	93,162.03	9,062.98	10.77
1909	200,000	110,000.00	.....	.....	98,153.30	4,991.27	5.36
1910	120,000	120,000.00	10,000.00	9.09	102,098.09	3,944.79	4.02
1911	130,000	125,000.00	5,000.00	4.17	102,911.21	813.12	.80
1912	125,000	125,000.00	.....	.....	106,466.20	3,554.99	3.45
1913	175,000	175,000.00	50,000.00	40.00	.....	.....	.....
1914	225,000	.....	.....	.....	.....	.....	.....

TEMPORARY-CLERK HIRE AT FIRST AND SECOND CLASS POST OFFICES.

1903	$150,000	$175,000.00	$50,000.00	40.00	$168,902.07	$45,746.48	37.14
1904	200,000	200,000.00	25,000.00	14.29	188,421.03	19,518.96	11.55
1905	(7)	150,000.00	[8] 50,000.00	[8] 25.00	131,788.98	[8] 56,632.05	[8] 30.05
1906	150,000	150,000.00	.....	.....	150,649.27	18,860.29	14.31
1907	150,000	152,000.00	2,000.00	1.33	142,248.77	[8] 8,400.50	[8] 5.58
1908	165,000	[10] 225,000.00	73,000.00	48.03	174,911.93	32,663.16	22.96
1909	250,000	240,000.00	15,000.00	6.67	218,461.63	43,549.70	24.90
1910	250,000	250,000.00	10,000.00	4.17	224,414.25	5,952.62	2.72
1911	250,000	250,000.00	.....	.....	232,918.60	8,504.35	3.79
1912	250,000	250,000.00	.....	.....	237,629.65	4,711.05	2.02
1913	350,000	850,000.00	600,000.00	240.00	.....	.....	.....
1914	1,000,000	.....	.....	.....	.....	.....	.....

[1] Includes $25,224.03 transferred from compensation to postmasters on account of post offices discontinued.
[2] Includes $10,830.43 transferred from compensation to postmasters on account of post offices discontinued.
[3] Includes estimates for temporary clerks and for substitutes for clerks on vacation.
[4] Includes $700,000 for contract stations and $120,000 carried by appropriation act for 1908.
[5] Includes $750,000 for contract stations and $750,000 deficiency appropriation, and excludes $120,000 made available for clerks during fiscal year ended June 30, 1907.
[6] Includes $750,000 for contract stations, $24,800 for printers, mechanics and skilled laborers, and $711,000 for watchmen, messengers, and laborers previously paid from appropriation for clerk hire.
[7] Included in estimates for compensation to clerks.
[8] Decrease.
[9] Includes $10,000 deficiency appropriation.
[10] Includes $25,000 deficiency appropriation.

CONTRACT STATIONS, COMPENSATION $300 OR LESS.

Prior to 1907 clerks in charge of contract stations were paid from the appropriation for clerks, first and second class offices.]

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1907	[1]	$475,000.00					
1908	[1]	515,000.00	$40,000.00	8.42	$494,588.65	$42,245.87	9.34
1909	[1]	525,000.00	10,000.00	1.94	518,703.66	24,115.01	4.88
1910	$535,000	535,000.00	10,000.00	1.90	522,576.09	3,872.43	.75
1911	535,000	580,000.00	45,000.00	8.41	542,610.54	20,034.45	3.83
1912	600,000	600,000.00	20,000.00	3.45	559,427.22	16,816.68	3.10
1913	[2] 930,000	600,000.00					
1914	[2] 1,250,000						

CONTRACT STATIONS, COMPENSATION ABOVE $300.

[Prior to 1907 clerks in charge of contract stations were paid from the appropriation for clerks, first and second class offices.]

1907	[1]	$225,000.00					
1908	[1]	235,000.00	$10,000.00	4.44	$234,236.06	$17,537.42	8.09
1909	[1]	265,000.00	30,000.00	12.76	264,497.77	30,261.71	12.92
1910	$300,000	300,000.00	35,000.00	13.21	297,218.01	32,720.24	12.37
1911	300,000	300,000.00			297,939.47	721.46	.24
1912	330,000	330,000.00	30,000.00	10.00	292,335.87	[3] 5,603.60	[3] 1.88
1913	[2]	330,000.00					
1914	[2]						

WATCHMEN, MESSENGERS, AND LABORERS.

[Prior to 1909 watchmen, messengers, and laborers were paid from the appropriation for clerks, first and second class offices.]

1909	[1]	$719,500.00			$687,121.79		
1910	$787,000	787,000.00	$68,500.00	9.52	753,398.93	$66,277.14	9.64
1911	850,000	850,000.00	63,000.00	8.01	795,661.31	42,262.38	5.61
1912	900,000	900,000.00	50,000.00	5.88	860,733.86	65,072.55	8.18
1913	[4] 1,019,600	1,008,000.00	108,000.00	12.00			
1914	1,120,000						

PRINTERS, MECHANICS, AND SKILLED LABORERS.

[Prior to 1909 printers, mechanics, and skilled laborers were paid from the appropriation for clerks, first and second class offices.]

1909	[1]	$24,800.00			$22,775.77		
1910	$24,800	24,800.00			23,013.04	$237.27	1.04
1911	24,800	24,800.00			21,965.27	[3] 1,047.77	[3] 4.55
1912	44,600	[5] 44,600.00	[5] $19,800.00	79.84	39,201.16	17,235.89	78.46
1913	[4]	44,600.00					
1914	44,600						

SEPARATING SERVICE AT THIRD AND FOURTH CLASS POST OFFICES.

1903	$1,100,000	$1,100,000.00	$50,000.00	4.76	$1,080,919.42	$77,393.54	7.71
1904	1,300,000	1,300,000.00	200,000.00	18.18	1,102,691.45	21,772.03	2.01
1905	[6] 1,700,000	750,000.00			723,181.99	[3] 379,509.46	[3] 34.42
1906	[7] 900,000	800,000.00	50,000.00	6.67	748,015.18	24,833.19	3.43
1907	800,000	800,000.00			767,385.94	19,370.76	2.59
1908	775,000	775,000.00	[3] 25,000.00	[3] 3.12	743,352.24	[3] 24,033.70	[3] 3.13
1909	775,000	750,000.00	[3] 25,000.00	[3] 3.23	710,190.72	[3] 33,161.52	[3] 4.46
1910	725,000	725,000.00	[3] 25,000.00	[3] 3.33	683,187.90	[3] 27,002.82	[3] 3.80
1911	700,000	700,000.00	[3] 25,000.00	[3] 3.45	679,347.71	[3] 3,840.19	[3] .56
1912	700,000	700,000.00			647,616.49	[3] 31,731.22	[3] 4.67
1913	700,000	700,000.00					
1914	700,000						

NOTE.—The reduction in the appropriation for separating service in 1905 is due to the fact that in that year appropriations were made for the first time for regular clerk hire at third-class post offices and for unusual conditions at third and fourth class post offices.

[1] Included in estimate for compensation to clerks.
[2] Consolidation of appropriations recommended.
[3] Decrease.
[4] Printers, mechanics, and skilled laborers included in estimate for watchmen, messengers, and laborers.
[5] Includes mechanics, City Delivery Service.
[6] Includes estimates for regular clerk hire at third-class post offices and for unusual conditions at third and fourth class post offices.
[7] Includes estimate for unusual conditions at third and fourth class post offices.

UNUSUAL CONDITIONS AT POST OFFICES.

[Prior to 1905 expenditures for unusual conditions were made from the appropriation for separating service.]

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1905	[1] $1,700,000	[2] $50,000.00			$40,660.83		
1906	[3] 900,000	[2] 50,000.00			48,919.44	$8,258.61	20.31
1907	75,000	[2] 100,000.00	$50,000.00	100.00	99,586.98	50,667.54	103.57
1908	100,000	100,000.00			99,179.31	[4] 407.67	[4] .41
1909	150,000	125,000.00	25,000.00	25.00	92,001.74	[4] 7,177.57	[4] 7.23
1910	125,000	125,000.00			98,871.81	6,870.07	7.47
1911	125,000	125,000.00			93,705.51	[4] 5,166.30	[4] 5.22
1912	125,000	[5] 140,000.00	[5] 15,000.00	12.00	99,557.11	5,851.60	6.24
1913	125,000	125,000.00	[4] 15,000.00	[4] 10.71			
1914	125,000						

REGULAR CLERK HIRE AT THIRD-CLASS POST OFFICES.

[Prior to 1905 there was no appropriation for regular clerk hire at third-class offices.]

190	[6] $1,700,000	$700,000.00			$607,559.74		
1906	900,000	750,000.00	$50,000.00	7.14	654,633.67	$47,073.93	7.75
1907	900,000	750,000.00			709,392.60	54,758.93	8.36
1908	900,000	800,000.00	50,000.00	6.67	800,486.14	91,093.54	12.84
1909	2,000,000	1,150,000.00	350,000.00	43.75	1,144,615.50	344,129.36	42.99
1910	1,250,000	1,250,000.00	100,000.00	8.70	1,211,534.68	66,919.18	5.84
1911	1,300,000	1,330,000.00	80,000.00	6.40	1,206,852.31	[4] 4,682.37	[2] .39
1912	1,330,000	1,330,000.00			1,280,201.77	73,349.46	6.08
1913	1,375,000	1,725,000.00	395,000.00	29.70			
1914	1,725,000						

RENT, LIGHT, AND FUEL AT FIRST, SECOND, AND THIRD CLASS POST OFFICES.

1903	$2,250,000	[7] $2,400,000.00	$250,000.00	11.63	$2,365,194.49	$240,014.20	11.29
1904	2,500,000	2,550,000.00	150,000.00	6.25	2,448,267.69	83,073.20	3.51
1905	2,750,000	[8] 2,690,000.00	140,000.00	5.49	2,579,181.84	130,914.15	5.35
1906	2,800,000	2,800,000.00	110,000.00	5.24	2,727,232.16	148,050.32	5.74
1907	3,000,000	3,000,000.00	200,000.00	7.14	2,910,575.50	183,343.34	6.72
1908	3,150,000	3,229,000.00	229,000.00	7.63	3,206,126.32	295,550.82	10.15
1909	3,350,000	[10] 3,491,000.00	262,000.00	8.11	3,481,058.37	274,932.05	8.57
1910	3,860,000	3,975,000.00	484,000.00	13.86	3,828,822.81	347,764.44	9.99
1911	4,100,000	4,100,000.00	125,000.00	3.14	4,060,678.79	231,855.98	6.05
1912	4,400,000	4,400,000.00	300,000.00	7.32	4,248,384.13	187,705.34	4.62
1913	4,640,000	4,550,000.00	150,000.00	3.41			
1914	5,050,000						

MISCELLANEOUS ITEMS, FIRST AND SECOND CLASS POST OFFICES.

1903	$5250,000	$250,000.00			$262,607.33	$7,730.33	3.03
1904	250,000	250,000.00			247,579.08	[4] 15,028.25	[4] 5.72
1905	250,000	250,000.00			243,080.64	[4] 4,498.44	[4] 1.82
1906	250,000	225,000.00	[4] $25,000.00	[4] 10.00	223,551.35	[4] 19,529.29	[4] 8.03
1907	250,000	250,000.00	25,000.00	11.11	240,242.30	16,690.95	7.46
1908	265,000	[11] 275,000.00	25,000.00	10.00	264,667.72	24,425.42	10.17
1909	370,000	275,000.00			268,338.04	3,670.32	1.39
1910	350,000	300,000.00	25,000.00	9.09	292,732.69	24,394.65	9.09
1911	325,000	300,000.00			288,403.84	[4] 4,328.85	[4] 1.48
1912	325,000	325,000.00	25,000.00	8.33	306,515.77	18,111.93	6.28
1913	350,000	350,000.00	25,000.00	7.69			
1914	400,000						

[1] Includes estimates for separating service at third and fourth class post offices and for regular clerk hire at third-class post offices.
[2] For third and fourth class post offices.
[3] Includes estimate for separating service at third and fourth class post offices.
[4] Decrease.
[5] Includes $15,000 made available for 1911.
[6] Includes estimates for separating service and for unusual conditions at third and fourth class post offices.
[7] Includes $50,000 deficiency appropriation.
[8] Includes $140,000 deficiency appropriation.
[9] Includes $79,000 deficiency appropriation.
[10] Excludes $97,000 made available for 1908.
[11] Includes $25,000 deficiency appropriation.

RENTAL AND PURCHASE OF CANCELING MACHINES.

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1903	$190,000	$190,000.00	[1] $225.00	.....	$199,477.88	[2] $247.12	[1] 0.12
1904	300,000	250,000.00	60,000.00	31.58	174,651.45	[1] 24,826.43	[1] 12.44
1905	250,000	200,000.00	[1] 50,000.00	[1] 20.00	186,918.58	12,267.13	7.02
1906	250,000	225,000.00	25,000.00	12.50	222,351.15	35,432.57	18.95
1907	275,000	250,000.00	25,000.00	11.11	243,913.91	21,562.76	9.70
1908	300,000	275,000.00	25,000.00	10.00	274,558.76	30,644.85	12.56
1909	315,000	300,000.00	25,000.00	9.09	298,885.28	24,326.52	8.86
1910	325,000	310,000.00	10,000.00	3.33	306,737.88	7,852.60	2.63
1911	310,000	310,000.00	.....	.....	309,083.97	2,346.09	.76
1912	325,000	310,000.00	.....	.....	293,595.21	[1] 15,488.76	[1] 5.01
1913	310,000	310,000.00	.....	.....	.....	.....	.....
1914	300,000	.....	.....	.....	.....	.....	.....

INCIDENTAL EXPENSES, CITY DELIVERY SERVICE.

1903	$300,000	$272,300.00	$52,300.00	23.77	$272,302.73	$39,939.99	17.19
1904	300,000	300,000.00	27,700.00	10.17	54,401.49	[1] 217,901.24	[1] 80.02
1905	300,000	300,000.00	.....	.....	96,498.10	42,096.61	77.38
1906	300,000	300,000.00	.....	.....	127,299.61	30,801.51	31.92
1907	40,000	40,000.00	[1] 260,000.00	[1] 86.06	31,466.99	[1] 95,832.62	[1] 75.28
1908	45,000	45,000.00	5,000.00	12.50	40,133.70	8,666.71	27.54
1909	[3]	45,000.00	.....	.....	41,607.25	1,473.55	3.67
1910	45,000	45,000.00	.....	.....	44,821.60	3,214.35	7.72
1911	45,000	35,000.00	[1] 10,000.00	[1] 22.22	32,463.23	[1] 12,358.37	[1] 27.57
1912	35,000	35,000.00	.....	.....	30,549.33	[1] 1,913.90	[1] 5.89
1913	35,000	35,000.00	.....	.....	.....	.....	.....
1914	50,000	.....	.....	.....	.....	.....	.....

PAY OF LETTER CARRIERS AT ESTABLISHED OFFICES.

1903	$17,430,450	$17,430,450.00	$1,349,550.00	8.39	$17,343,819.23	$1,319,347.52	8.23
1904	19,028,800	19,028,800.00	1,598,350.00	9.17	18,689,071.33	1,345,252.10	7.76
1905	20,606,250	20,250,000.00	1,221,200.00	6.42	19,868,323.52	1,179,252.19	6.31
1906	21,296,575	21,296,575.00	1,046,575.00	5.16	20,922,985.45	1,054,661.93	5.31
1907	22,228,000	22,228,000.00	931,425.00	4.13	22,121,899.74	1,198,914.29	5.73
1908	23,384,700	24,450,000.00	2,222,000.00	10.00	24,148,305.25	2,026,405.51	9.16
1909	[3] 29,950,000	27,835,000.00	3,385,000.00	13.84	27,406,338.63	3,258,533.38	13.49
1910	29,800,000	29,623,500.00	1,788,500.00	6.43	29,297,511.21	1,890,672.58	6.90
1911	31,500,000	31,000,000.00	1,376,500.00	4.65	30,636,391.00	1,338,879.79	4.57
1912	32,250,000	32,180,000.00	1,180,000.00	3.81	31,724,222.09	1,087,831.09	3.55
1913	32,740,000	32,752,175.00	572,175.00	1.78	.....	.....	.....
1914	34,860,000	.....	.....	.....	.....	.....	.....

SUBSTITUTE, AUXILIARY, AND TEMPORARY LETTER CARRIERS.

(Prior to 1908 no separate appropriation was made for substitute, auxiliary, and temporary letter carriers

1908	[4]	$1,200,000.00	.....	.....	$1,019,446.17	.....	.....
1909	[4]	1,300,000.00	$100,000.00	8.33	1,073,510.95	$54,064.78	5.30
1910	$1,300,000	1,300,000.00	.....	.....	1,057,628.32	[1] 15,882.63	[1] 1.48
1911	1,300,000	1,100,000.00	[1] 200,000.00	[1] 15.38	970,104.90	[1] 87,523.42	[1] 8.27
1912	1,100,000	1,100,000.00	.....	.....	1,012,772.95	42,668.05	4.40
1913	1,200,000	1,600,000.00	500,000.00	45.46	.....	.....	.....
1914	2,285,000	.....	.....	.....	.....	.....	.....

PAY OF LETTER CARRIERS AT NEW OFFICES.

1903	$90,000	$90,000.00	$15,000.00	20.00	$83,727.09	$1,544.53	1.88
1904	100,000	100,000.00	10,000.00	11.11	65,048.10	[1] 18,678.99	[1] 22.31
1905	125,000	110,000.00	10,000.00	10.00	29,667.46	[1] 35,380.64	[1] 54.40
1906	110,000	110,000.00	.....	.....	27,901.97	[1] 1,765.49	[1] 5.95
1907	75,000	50,000.00	[1] 60,000.00	[1] 54.54	43,939.15	16,037.18	57.48
1908	50,000	[5] 70,000.00	20,000.00	40.00	57,336.34	13,397.19	30.49
1909	[4]	[6] 95,000.00	25,000.00	35.71	79,844.63	22,508.29	39.26
1910	100,000	[6] 120,000.00	25,000.00	26.32	63,450.31	[1] 16,394.32	[1] 20.53
1911	120,000	90,000.00	[1] 30,000.00	[1] 25.00	35,291.58	[1] 28,158.73	[1] 44.37
1912	90,000	75,000.00	[1] 15,000.00	[1] 16.67	54,371.30	19,079.72	54.06
1913	75,000	50,000.00	[1] 25,000.00	[1] 33.33	.....	.....	.....
1914	75,000	.....	.....	.....	.....	.....	.....

[1] Decrease.
[3] Included in estimate for miscellaneous items, first and second class offices.
[2] Includes $700,000 for pay of letter carriers at offices where city delivery is established during the fiscal year to which the appropriation applies.
[4] Included in estimate for pay of letter carriers at offices where city delivery is in operation.
[5] Includes a deficiency appropriation of $20,000.
[6] Includes $20,000 appropriated for 1910, made available for 1909.

HORSE HIRE.

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1903	$650,000	$650,000.00	$138,031.49	26.96	$627,587.96	$64,640.05	11.48
1904	750,000	750,000.00	100,000.00	15.38	665,587.97	38,000.01	6.05
1905	800,000	700,000.00	[1] 50,000.00	[1] 6.66	658,169.24	[1] 7,418.73	[1] 1.11
1906	725,000	725,000.00	25,000.00	3.57	682,305.96	24,136.72	3.67
1907	750,000	725,000.00	.....	.....	720,672.03	38,366.07	5.62
1908	750,000	[2] 765,000.00	40,000.00	5.52	743,815.64	23,143.61	3.21
1909	900,000	800,000.00	35,000.00	4.58	785,134.20	41,318.56	5.55
1910	875,000	855,000.00	55,000.00	6.87	825,423.90	40,289.70	5.13
1911	925,000	925,000.00	70,000.00	8.19	848,410.09	22,986.19	2.78
1912	950,000	925,000.00	.....	.....	879,683.14	31,273.05	3.69
1913	975,000	975,000.00	50,000.00	5.40	.....	.....	.....
1914	1,530,000	.....	.....	.....	.....	.....	.....

CAR FARE AND BICYCLES.

1903	$275,000	$275,000.00	$20,000.00	7.84	$254,748.89	$24,619.96	10.70
1904	300,000	300,000.00	25,000.00	9.09	269,586.68	14,837.79	5.82
1905	325,000	300,000.00	.....	.....	282,534.70	12,948.02	4.80
1906	350,000	325,000.00	25,000.00	8.33	302,349.26	19,814.56	7.01
1907	350,000	340,000.00	15,000.00	4.61	316,994.73	14,645.47	4.84
1908	360,000	[3] 360,000.00	20,000.00	5.88	341,735.52	24,740.79	7.80
1909	425,000	400,000.00	40,000.00	11.11	375,205.52	33,470.00	9.79
1910	425,000	425,000.00	25,000.00	6.25	399,642.08	24,436.56	6.51
1911	475,000	460,000.00	35,000.00	8.24	423,350.51	23,708.43	5.93
1912	500,000	475,000.00	15,000.00	3.26	435,678.96	12,328.45	2.91
1913	500,000	500,000.00	25,000.00	5.26	.....	.....	.....
1914	500,000	.....	.....	.....	.....	.....	.....

DETROIT RIVER POSTAL SERVICE.

1903	([4])	$4,500.00	.....	.....	$4,645.00	.....	.....
1904	$4,500	4,500.00	.....	.....	3,836.00	[1] $809.00	[1] 17.42
1905	12,000	4,500.00	.....	.....	4,446.00	610.00	15.90
1906	4,500	4,500.00	.....	.....	4,450.00	4.00	.09
1907	4,500	4,500.00	.....	.....	4,450.00	.....	.....
1908	4,500	4,500.00	.....	.....	4,450.00	.....	.....
1909	4,500	4,500.00	.....	.....	4,450.00	.....	.....
1910	6,000	6,500.00	$2,000.00	44.44	6,500.00	2,050.00	46.07
1911	6,500	6,500.00	.....	.....	6,500.00	.....	.....
1912	6,500	6,500.00	.....	.....	6,500.00	.....	.....
1913	6,500	6,500.00	.....	.....	.....	.....	.....
1914	6,500	.....	.....	.....	.....	.....	.....

FEES TO SPECIAL-DELIVERY MESSENGERS.

[Prior to 1902 no appropriation was made for fees to special-delivery messengers.]

1903	$742,000	$742,000.00	$77,000.00	11.58	$716,770.47	$95,747.10	15.41
1904	800,000	800,000.00	58,000.00	7.95	791,103.12	74,332.65	10.37
1905	950,000	900,000.00	100,000.00	12.50	847,510.15	56,407.03	7.13
1906	950,000	[5] 920,000.00	20,000.00	2.22	934,540.00	87,029.85	10.27
1907	1,000,000	[6] 1,025,000.00	105,000.00	11.41	1,031,971.56	97,431.56	10.42
1908	1,075,000	1,075,000.00	50,000.00	4.88	1,098,852.11	66,880.55	6.48
1909	1,200,000	1,200,000.00	125,000.00	11.63	1,115,377.08	16,524.97	15.03
1910	1,300,000	1,300,000.00	100,000.00	8.33	1,235,234.61	119,857.53	10.74
1911	1,325,000	1,325,000.00	25,000.00	1.92	1,340,663.16	105,428.55	8.53
1912	1,400,000	1,400,000.00	75,000.00	5.66	1,469,177.80	128,514.64	9.58
1913	1,600,000	1,600,000.00	200,000.00	14.28	.....	.....	.....
1914	1,825,000	.....	.....	.....	.....	.....	.....

[1] Decrease.
[2] Includes a deficiency appropriation of $15,000.
[3] Includes a deficiency appropriation of $10,000.
[4] No specific amount.
[5] Includes a deficiency appropriation of $20,000.
[6] Includes a deficiency appropriation of $75,000.

CAR FARE FOR SPECIAL-DELIVERY MESSENGERS.

Year ended June 30—	Estimate.	Appropriation.			Expenditure.		
		Amount.	Increase.	Per cent of increase.	Amount.	Increase.	Per cent of increase.
1903	$10,000	$10,000.00			$6,577.15	$2,867.95	77.32
1904	12,000	12,000.00	$2,000.00	20.00	6,998.47	421.32	6.41
1905	12,000	10,000.00	[3] 2,000.00	[3] 16.67	7,693.28	694.81	9.93
1906	10,000	10,000.00			8,417.31	724.03	9.41
1907	10,000	10,000.00			9,073.87	656.56	7.80
1908	12,000	10,000.00			9,415.74	341.87	3.77
1909	12,000	12,000.00	2,000.00	20.00	10,558.14	1,142.40	12.13
1910	12,000	12,000.00			9,986.86	[1] 571.28	[1] 5.41
1911	13,000	13,000.00	1,000.00	8.33	9,839.81	[1] 147.05	[1] 1.47
1912	13,000	13,000.00			10,304.93	465.12	4.73
1913	13,000	13,000.00					
1914	14,000						

STREET-CAR COLLECTION SERVICE.

[Prior to 1909 no appropriation was made for this service.]

1909	$10,900	$10,900.00			$8,105.00		
1910	10,000	10,000.00	$900.00	8.26	8,465.00	$360.00	4.44
1911	15,000	10,000.00			8,740.00	275.00	3.25
1912	10,000	10,000.00			8,740.00		
1913	10,000	10,000.00					
1914	10,000						

[1] Decrease.

REPORTS OF THE DIVISIONS.

DIVISION OF POSTMASTERS' APPOINTMENTS.

There were 1,979 presidential postmasters appointed during the year ended June 30, 1912. Of these, 1,404 were reappointed, 1,095 of such appointments being on the expiration of the postmasters' terms, 254 on the advancement of their offices to the presidential class, 42 on the expiration of recess commissions, 12 on the change of names of post offices, and 1 on the change of the postmaster's name by marriage.

There were 575 new appointments, 204 of which were at offices where the commissions of the postmasters had expired, 47 were at offices advanced to the presidential class, 193 at offices where the postmasters had resigned, 98 where the postmasters had died, 31 where they had been removed for cause, 1 on the change of name of office, and 1 on the expiration of recess commission. Nearly 85 per cent of the postmasters whose commissions expired were reappointed.

The number of fourth-class postmasters appointed during the year was 7,630. Of this number 273 were reappointed, 33 of such appointments being on the relegation of the office to the fourth class, 168 on the change of name of office, and 72 on the change of postmaster's name by marriage.

The number of new appointments was 7,357, 1,060 of such postmasters being appointed on the establishment of new offices, 4,992 at offices where the postmasters had resigned, 462 where the postmasters had died, 791 where the postmasters had been removed for cause, 6 on the relegation of offices to the fourth class, 45 on account of change

of name of post office, and 1 by reason of change of name of postmaster by marriage. Where another appointment was necessary by reason of the relegation of the office, change of name of office, or change of postmaster's name by marriage, 84 per cent of the incumbents were reappointed.

The following tables show in detail the principal operations of the Division of Postmasters' Appointments for the fiscal year as compared with those for the preceding year:

Item.	Year ended June 30—		Increase.	Decrease.
	1911	1912		
Postmasters appointed:				
At presidential offices—				
On resignation of predecessor	188	193	5	.....
On death of predecessor	118	98	.....	20
On removal of predecessor	45	31	.....	14
On expiration of term—				
New appointments	341	204	.....	137
Reappointments	1,014	1,095	81	.....
On expiration of recess commission—				
New appointments	4	1	.....	3
Reappointments	165	42	.....	123
On advancement of office to presidential grade—				
New appointments	99	47	.....	52
Reappointments	304	254	.....	50
On change of name of office—				
New appointments	.....	1	1	.....
Reappointments	6	12	6	.....
On change of postmaster's name by marriage—				
New appointments	.....	.....	.....	.....
Reappointments	4	1	.....	3
Total at presidential offices	2,288	1,979	93	402
At fourth-class offices:				
On resignation of predecessor	5,270	4,992	.....	278
On death of predecessor	522	462	.....	60
On removal of predecessor	878	791	.....	87
On relegation of office to fourth class	17	.....	22	.....
New appointments	(1)	6	.....	.....
Reappointments	(1)	33	.....	.....
On establishment of office	1,347	1,060	.....	287
On change of name of office	206	.....	7	.....
New appointments	(1)	45	.....	.....
Reappointments	(1)	168	.....	.....
On change of postmaster's name by marriage	62	.....	11	.....
New appointments	(1)	1	.....	.....
Reappointments	(1)	72	.....	.....
Total at fourth-class offices	8,302	7,630	40	712
Total at all offices	10,590	9,609	133	1,114
Presidential post offices discontinued	13	11	.....	2
Names of post offices changed	253	.....	.....	27
Presidential	(1)	13	.....	.....
Fourth class	(1)	213	.....	.....

Item.	Presidential offices.	Fourth-class offices.	Total.
Bonds examined and accepted:			
Bonds of newly appointed postmasters	1,979	7,630	9,609
Renewed bonds	5,932	8,852	14,784
Total	7,911	16,482	24,393
Commissions issued	1,979	7,630	9,609

[1] Not separately reported.

The following table gives the number of post offices of each class at the close of business on June 30 of each year from 1902 to 1912, inclusive:

Year.	First class.	Second class.	Third class.	Total presidential classes.	Fourth class.	Total, all classes.
1902	220	1,023	3,488	4,731	71,193	75,924
1903	242	1,107	3,690	5,039	69,130	74,169
1904	265	1,204	3,896	5,365	65,766	71,131
1905	275	1,258	4,120	5,653	62,478	68,131
1906	290	1,305	4,315	5,910	59,690	65,600
1907	316	1,400	4,598	6,314	56,345	62,659
1908	354	1,465	4,998	6,817	53,887	60,704
1909	384	1,595	5,221	7,200	52,944	60,144
1910	398	1,707	5,487	7,592	51,988	59,580
1911	423	1,823	5,731	7,977	51,260	59,237
1912	444	1,907	5,905	8,256	50,473	58,729

DIVISION OF SALARIES AND ALLOWANCES.

READJUSTMENT OF POSTMASTERS' SALARIES.

The following table shows the changes resulting from the annual readjustment of presidential postmasters' salaries and the assignment of post offices to the presidential classes on the basis of the receipts in the four quarters ended March 31, 1912, and also the number of presidential offices discontinued during the fiscal year 1912, and the number of offices advanced from the fourth class to the presidential grade on October 1, 1911, January 1, 1912, April 1, 1912, and July 1, 1912:

Item.	First class.	Second class.	Third class.	Total presidential.
Number of offices July 1, 1911	444	1,907	5,644	7,995
Increases:				
Advanced from fourth class Oct. 1, 1911		1	88	89
Advanced from fourth class Jan. 1, 1912			161	161
Advanced from fourth class Apr. 1, 1912			21	21
Advanced from lower class July 1, 1912	18	84	31	133
Relegated from higher class July 1, 1912		5	38	43
Decreases:				
Advanced to higher class July 1, 1912		18	83	101
Relegated to lower class July 1, 1912	5	38	60	103
Discontinued subsequent to July 1, 1911		1	10	11
Number of offices July 1, 1912	457	1,940	5,830	8,227
Net increase since July 1, 1911	13	33	186	232
Salaries of postmasters:				
July 1, 1912	$1,628,900	$4,576,100	$8,361,700	$14,566,700
Increase over salaries on July 1, 1911	49,300	81,300	219,400	350,000
Gross receipts:				
Four quarters ended Mar. 31, 1912	163,155,941	30,235,815	23,263,790	216,655,546
Increase over receipts for four quarters ended Mar. 31, 1911	8,065,370	654,170	1,546,488	10,266,028

QUARTERS FOR POST OFFICES, STATIONS, AND BRANCHES.

The number of offices, stations, and branches in Federal buildings and in leased quarters on June 30, 1912, as compared with June 30, 1911, was as shown on next page.

Items.	Years ended June 30, 1911 and 1912.					
	1911			1912		
	In Federal buildings.	In leased quarters.		In Federal buildings.	In leased quarters.	
		Number.	Rental.		Number.	Rental.
First-class offices	330	105	$173,125	353	101	$176,618
Stations	4	530	1,239,205	6	564	1,319,777
Branches	1	136	123,031	1	136	113,015
Second-class offices	186	1,562	1,087,628	238	1,560	1,120,912
Stations		16	9,479		20	8,299
Branches		3	1,230		4	2,030
Third-class offices	15	1,508	516,463	15	1,729	603,183
Fourth-class offices	3			3		
Total	539	3,860	3,150,161	616	4,114	3,343,834

POSTAL STATIONS AND BRANCH OFFICES.

The following table shows the changes in postal stations and branch offices during the year ended June 30, 1912:

Items.	Number.
Stations established:	
Delivery stations	39
Numbered stations	249
Total	288
Stations established in place of post offices discontinued:	
Delivery stations	12
Numbered stations	2
Total	14
Stations discontinued:	
Delivery stations	8
Numbered stations	82
Total	90
Delivery stations changed to numbered stations	2
Branch offices established	8
Branch offices discontinued	3
Branch offices established in place of post offices discontinued	6
Stations changed to branch offices	1
Branch offices changed to stations	0

Number of postal stations and branch offices in operation on June 30, 1912.

Numbered stations	4,247
Lettered stations	316
Local-named stations	478
Branch post offices	252
Total	5,293

Number of contract stations and contract branch offices in operation on June 30, 1912.

Numbered stations	4,239
Lettered stations	68
Local-named stations	88
Branch post offices	78
Total	4,473

DIVISION OF CITY DELIVERY.

The City Delivery Service was extended during the year to 83 additional post offices, and 2 city delivery offices were consolidated with others which had the service, and 1 office was discontinued, making a net increase of 80. At the close of the year the number of regular carriers was 29,962, an increase during the year of 794.

The following table shows the development of the service during the 48 years of its existence:

Year ended June 30—	City delivery offices.		Carriers.		Gross receipts of city delivery offices.		Cost of service.		Ratio of cost to gross receipts.	Cost per carrier.
	Number.	Increase.	Number.	Increase.	Amount.	Increase.	Amount.	Increase.		
				Per ct.		*Per ct.*		*Per ct.*	*Per ct.*	
1864	66	.....	685	.....	.....	.....	$317,063.20	.....	.....	$462.86
1865	45	.....	757	.....	.....	.....	448,664.51	.....	.....	592.68
1866	46	.....	863	.....	.....	.....	589,236.41	.....	.....	682.77
1867	47	.....	943	.....	.....	.....	699,934.34	.....	.....	742.24
1868	48	.....	1,198	.....	.....	.....	995,934.59	.....	.....	831.33
1869	48	.....	1,246	.....	.....	.....	1,183,915.31	.....	.....	950.17
1870	51	.....	1,362	.....	.....	.....	1,230,079.85	.....	.....	903.14
1871	52	.....	1,419	.....	.....	.....	1,353,923.23	.....	.....	954.14
1872	52	.....	1,443	.....	.....	.....	1,385,965.76	.....	.....	970.43
1873	52	.....	1,498	.....	.....	.....	1,422,495.48	.....	.....	949.59
1874	87	35	2,049	.....	.....	.....	1,802,696.41	.....	.....	879.79
1875	87	.....	2,195	.....	.....	.....	1,880,041.99	.....	.....	856.51
1876	87	.....	2,269	.....	.....	.....	1,981,186.51	.....	.....	873.15
1877	87	.....	2,265	.....	.....	.....	1,893,619.85	.....	.....	836.03
1878	87	.....	2,275	0.4	$12,117,820.24	.....	1,824,166.96	.....	15.05	801.84
1879	88	1	2,359	3.6	13,066,470.76	7.8	1,947,706.61	6	14.90	825.69
1880	104	16	2,628	13.9	15,082,166.65	15.4	2,363,693.14	21.4	15.66	879.31
1881	109	5	2,861	6.4	16,887,086.23	11.9	2,499,911.54	5.7	13.61	873.78
1882	112	3	3,115	8.8	19,414,772.80	14.9	2,623,262.74	4.9	13.51	842.45
1883	154	42	3,680	18.1	22,317,499.94	14.9	3,173,336.51	20.9	14.21	862.31
1884	159	5	3,890	5.7	21,596,020.08	3.2	3,504,206.52	10.4	16.22	891.82
1885	178	19	4,358	12	21,940,169.42	1.6	3,985,952.55	13.4	18.15	914.62
1886	181	3	4,841	11	22,629,826.66	3.1	4,312,306.70	9	19.05	890.58
1887	189	8	5,310	9.6	25,014,385.30	10.5	4,618,692.07	6.7	18.46	869.82
1888	358	169	6,346	19.3	29,459,943.33	13.7	5,422,356.36	17.4	18.40	854.45
1889	401	43	8,257	30.1	32,206,493.72	9.3	6,957,941.90	28.3	21.60	842.67
1890	454	53	9,066	9.7	36,648,000.49	13.8	7,976,202.72	14.6	21.21	879.79
1891	519	65	10,130	11.7	40,405,386.28	10.2	9,072,160.31	13.7	22.47	895.57
1892	568	49	10,737	5.8	44,031,728.77	9	9,966,892.67	9.9	22.63	928.27
1893	610	42	11,625	8.2	48,444,363.83	10	10,683,575.26	7	22.05	919.01
1894	610	.....	11,736	.9	45,801,210.16	[1] 5.15	11,229,436.78	5.1	24.51	956.83
1895	604	.....	12,714	8.2	49,128,621.42	7.2	12,135,544.93	8	24.70	954.50
1896	627	23	12,834	.94	52,567,624.42	7.7	12,713,861.41	4.7	24.18	970.59
1897	629	2	12,931	.75	52,741,470.37	.33	12,827,396.69	.88	24.32	991.98
1898	688	59	13,696	5.9	56,681,804.68	7.47	13,387,506.10	4.4	23.62	977.47
1899	735	47	14,256	4	61,807,916.82	9.04	13,905,800.00	3.9	22.50	975.43
1900	796	61	15,322	7.48	66,775,903.86	8	14,512,190.04	4.4	21.73	979.78
1901	866	71	16,389	6.96	74,295,394.67	11.26	15,752,600.00	8.55	21.20	961.17
1902	933	67	17,787	8.5	83,330,812.37	12.16	17,123,310.90	8.7	20.55	962.80
1903	1,032	99	19,542	9.9	93,466,623.13	12.14	19,337,986.00	12.93	20.69	989.56
1904	1,100	68	20,758	6.24	101,708,230.31	8.82	20,561,208.10	6.33	20.22	990.38
1905	1,144	44	21,778	4.91	109,801,335.35	7.96	20,919,078.13	1.71	19.05	960.56
1906	1,184	40	22,965	5.45	120,852,776.60	10.06	21,980,632.92	5.07	18.19	957.14
1907	1,240	56	24,577	7.02	133,562,381.11	10.52	23,170,203.63	5.41	17.35	942.76
1908	1,330	90	26,352	7.22	139,585,504.07	4.51	26,258,039.16	13.33	18.81	996.43
1909	1,440	110	27,620	4.81	149,124,130.76	6.83	29,738,123.05	13.20	19.93	1,076.68
1910	1,492	52	28,715	3.96	166,135,842.68	11.41	31,683,591.17	6.54	19.07	1,103.38
1911	1,541	49	29,168	1.58	179,746,303.42	8.19	32,970,451.23	4.06	18.34	1,130.36
1912	1,621	80	29,962	2.72	188,306,493.78	4.76	34,152,517.77	3.59	18.14	1,139.86

[1] Decrease.

NOTE.—Prior to the fiscal year 1878 the gross receipts of city-delivery offices were not reported separately by the Auditor for the Post Office Department.

SPECIAL-DELIVERY SERVICE.

Fees of 8 cents each on special-delivery mail were claimed by postmasters last year to the total amount of $1,469,177.80, indicating that 18,364,722 pieces of mail of this character were delivered, being an increase of 1,608,223 pieces over last year, or 9.6 per cent. These figures relate to all post offices, irrespective of class.

Respectfully,

C. P. GRANDFIELD,
First Assistant Postmaster General.

HON. FRANK H. HITCHCOCK,
Postmaster General.

REPORT

OF THE

UNITED STATES CIVIL SERVICE COMMISSION.

WASHINGTON, D. C., *December 31, 1912.*

SIR: In presenting the annual report of the commission for the year ended June 30, 1912, we desire to express our gratification because of the substantial progress of the competitive system and the excellent manner in which the civil-service act and rules have been generally observed throughout the different branches of the Government.

The beneficial effects of the enforcement of the civil-service act and rules, with their continued development and increasing application, are now more than ever apparent. In spirit and in letter the commission has had the sympathy and support of the President and the heads of departments in the observance of merit principles in the parts of the service subject to the rules, and there has been a growing voluntary application of those principles in other parts of the executive civil service, as for instance, in the consular and diplomatic services. Selections for appointment on a basis of merit and retention during good behavior and efficiency are more and more marked in the unclassified as well as in the classified service. Complaints of the nonobservance of the act and rules are comparatively few and unimportant. Appointments and removals in the classified service are being more completely withdrawn from politics and made with increasing regard to the interests of the public service, and along with the extension of the merit system there has been developed a higher order of character and efficiency in the branches of the service subject to its operation.

Extent of the Classified Service.

On June 30, 1912, there were approximately 395,460[1] officers and employees of the executive civil service. Of these, 236,061 held positions subject to competitive examination under the civil-service rules, an increase of 4,648 during the year, and about 6,500 were unclassified laborers subject to tests of physical fitness under the labor regulations.[2] Of the 159,399 persons whose positions are not subject to competitive examination under the civil service rules, 10,397 are presidential appointees, 8,228 being postmasters of the first, second, and third classes; 36,332 are fourth-class postmasters;[3] 12,850 were reported in 1907 as clerks at post offices having no free-delivery service;[4] 28,191 are minor employees, chiefly laborers, on the Isthmian Canal work; 729 are employees of the Department of Commerce and

[1] These figures are based upon reports furnished by the several departments as required by the civil-service rules. Owing to inaccuracies inherent in the gathering of data and to inadvertent omissions by the departments, the figures must be accepted as only approximate.

An estimate prepared Nov. 22, 1912, and submitted to the House Committee on Appropriations, gave the total number of employees in the Government service, excluding the Army, Navy, and Marine Corps, as 469,528, while the number shown by the detailed statistics of the commission is 395,460.

A compilation of statistics respecting the executive civil service was made in 1896, but owing to the rapid growth and expansion of the service these statistics soon became of little value. By an Executive order of Mar. 31, 1903, the heads of the executive departments and independent offices were directed to furnish to the Secretary of the Interior, for the preparation of the Official Register, the date of appointment of each officer and employee, and his age, length of service under the United States, and a statement of whether the position occupied by him was subject to appointment by the President, excepted, competitive, unclassified, temporary, or subject to contract. The Bureau of the Census compiled the statistics as to the classified service, collected in accordance with the Executive order, and these statistics form the basis of the commission's statements as to the extent and character of the classified service. The commission has revised the statistics from time to time in accordance with the reports of changes made by the departments, supplemented by the best obtainable information with respect to positions for which reports were not made. The number and variety of reports undoubtedly led to mistakes, and for nine years the commission has had no means of determining to what extent errors have crept into the statistics. The difference between the numbers as recently estimated and as contained in the commission's statistics is explained in part by the fact that the following portions of the service, with the number of officers and employees shown, have never been included in the commission's statistics. The discrepancy shown is only 2,268.

Estimate, Nov. 22, 1912		469,528
Judicial service	3,000	
Legislative service	2,870	
Diplomatic and consular services	535	
Substitute railway mail clerks	1,395	
Clerks in fourth-class post offices	64,000	
		71,800
Total of estimate after deducting above items		397,728
Total of table of commission		395,460
Discrepancy		2,268

[2] There are also about 300 positions in the consular service subject to examination requirements under regulations prescribed by the President. The consular regulations are outside the jurisdiction of the commission, but its chief examiner is, by designation of the President a member ex officio of the board of examiners.

[3] Thirteen thousand nine hundred and eighty-six positions of fourth-class postmasters were already in the competitive classified service, and the remaining positions (36 332 in number) were included in such service by the Executive order of October 15, 1912.

[4] This statement is from a bulletin of the Census Bureau and no later information is available. About 4,000 of the positions occupied by these employees became competitive under the Executive order of September 30, 1910, but only 991 of the employees had been given a competitive status at the end of the year covered by this report.

Labor, most of them in the Census Bureau, all appointed through examination or some other method prescribed by the Thirteenth Census act; 18,788 unclassified employees in the field service, and 2,056 in Washington are in the main mere unskilled laborers; and approximately 25,000 are mechanics and laborers at navy yards, subject to appointment under navy-yard regulations. The remaining 25,056 are excepted from examination under Schedule A, or are subject to noncompetitive examination under Schedule B of the civil-service rules. Of these, 935 are employed in Washington, and the others in branches of the field service. Few important positions are included among those excepted from examination. Their great variety will be seen by reference to Schedule A of the rules.

From July 16, 1883, to the present time, appointments to vacancies in the classified service have been made through competitive examinations; but the persons occupying positions at the date of their classification have generally been given all the privileges which they would have had if appointed upon examination. For many years the number appointed through examination amounted to a very small share of the entire service, but this number has steadily increased, until now the official force is mainly composed of those who were appointed through examination.

On February 15, 1912, the commission had service records of 224,665 employees in the competitive classified service. Of these, 176,666, or 78.6 per cent, entered through examination, and 47,999, or 21.4 per cent, were in the service at the time of classification. The number of employees in Washington was 25,860, of whom 17,150, or 66.3 per cent, were appointed through examination; and the number outside Washington was 198,805, of whom 159,516, or 80.2 per cent, were appointed through examination, and 19.8 per cent were classified with their positions. These figures indicate that more than three-fourths of all classified competitive employees at present in the service entered through competitive examination—two-thirds of the competitive classified employees who are in Washington and four-fifths of those outside.

Growth of the Classified Service.

The following statement shows additions to the competitive classified service, aside from mere natural growth, under existing provisions of the rules and Executive orders, during the year ended June 30, 1912:

Employees of mission schools transferred to Government control	18
Employee of State quarantine station transferred to Government control	1
For meritorious service over seas under Executive order of August 12, 1907	2
Laborers assigned to classified duties classified by existing Executive order	2
Postmaster at an office consolidated with another office	1
Total	24

There were no Executive orders and no acts of Congress extending the classified service during the fiscal year.

During the same period the following positions were excepted, by amendment of Schedule A of the civil-service rules, by operation of act of Congress, or by action of the commission:

By amendment of Schedule A:	
Confidential inspectors (additional), Interior Department, Executive order Apr. 10, 1912	3
By operation of act of Congress:	
Army paymasters' clerks given military status by Army appropriation act approved Mar. 3, 1911	90
By action of the commission:	
Recognition of classification withdrawn	1
	94

NOTE.—The following is the same information covering the period from July 1, 1912, to Oct. 16, 1912:

Additions to the classified service:	
By act of Congress—	
Superintendents of melting and refining, United States mints, withdrawn from presidential class	3
By Executive order—	
Employees of State Department given classified status, order of Aug. 24, 1912	14
Special employees, Internal-Revenue Service, order of Aug. 24, 1912	52
Experts and special agents, Department of Agriculture, order Aug. 26, 1912	115
Fourth-class postmasters, order of Oct. 15, 1912 [1]	36,236

EXCEPTIONS FROM EXAMINATION.

By Executive order:	
Officers to aid in important drafting work, State Department, order of Aug. 24, 1912	8
By action of commission:	
Recognition withdrawn of classification of an employee paid from the appropriation for the District of Columbia	1
Total	9

EXAMINATIONS AND APPOINTMENTS.

During the year ended June 30, 1912, 20,969 persons were appointed, transferred, or promoted, upon examination, to positions in the competitive classified service, and 2,183 persons were transferred, promoted, or reinstated without further examination. Including

[1] Classified prior to the order of Oct. 15, 1912:

Compensation under $500 per annum	10,575	
Compensation $500 or above	3,411	
Total		13,986
Classified by order of Oct. 15, 1912:		
Compensation under $500 per annum	31,779	
Compensation $500 or above	4,457	
Total		36,236
Grand total		50,222

appointments to the Philippine service and to positions of mere unskilled laborer, and excluding temporary appointments, 21,973 appointments were made as the result of competition. The number examined, number passed, and number appointed were as follows:

	Examined.	Passed.	Appointed.
Under civil-service rules:			
Original entrance—			
Field service	89,274	51,459	18,351
Departmental at Washington, D. C.	15,072	7,186	2,082
Total	104,346	58,645	20,433
Promotions, transfers, and reinstatements through examination.	1,732	606	536
Total under rules	106,078	59,251	20,969
Not under Federal civil-service act and rules:			
Philippine service	1,243	712	205
Under labor regulations	6,349	5,422	799
Total	113,670	65,385	21,973
Without further examination:			
Transfers and promotions			802
Reinstatements			1,381
Grand total	[1] 113,670	65,385	24,156

[1] In addition, and upon appropriate official request, the commission examined 988 applicants for admission to the District of Columbia service and to the Military and Naval Academies.

Excluding unclassified laborers and persons appointed in the Philippine service, there was a decrease of 2,287 in the number appointed as compared with the preceding fiscal year.

Examinations with Unusual Requirements.

In addition to the usual clerical, scientific, technical, and professional examinations held during the year, a number of examinations were given requiring unusual qualifications, among which may be mentioned the following with salaries from $3,000 to $4,800 per annum: Chief mechanical engineer, Bureau of Mines; associate statistician, Interstate Commerce Commission; quarry technologist, Bureau of Mines; metallurgical chemist, Bureau of Mines; chief physical chemist, Bureau of Mines; Indian reservation superintendent; chief irrigation engineer, Indian service; and chief of drainage investigations, Department of Agriculture. Examinations for positions of this character are almost without exception of the nonassembled type; that is to say, applicants are not required to assemble at a common point.

It has been found that high-grade examinations need not and often should not be confined to written questions and answers. These nonassembled examinations have been successful to a marked degree in filling positions requiring not only the highest expert knowledge but the highest expert administrative ability. The usual method of filling such positions is by promotion from lower expert positions of persons who originally entered the service through very thorough technical examinations. Where adequate material for promotion is

lacking in the lower grades to fill the high positions, examinations consisting of systematic and thorough inquiry into the education and training of the candidates, their achievements, experience, and success in handling men, and ability in executive affairs, are carried on by examiners who are themselves specialists in the subjects under consideration. Examinations of this character have been found to attract men of the highest type. The belief in many quarters that no distinguished expert or person of high professional or scientific attainments will compete in a civil-service examination is a fallacy. The expert examiners employed from time to time by the commission to pass upon the qualifications of competitors for such positions are men of the highest standing in their professions, and the competitors have no reluctance in presenting a statement of their qualifications for the position and a thesis on a subject connected with the duties of the position, to be verified from testimony adduced by close confidential inquiry and otherwise, and passed upon by these recognized experts. An annual appropriation of $2,000 recently obtained enables the commission to have as examiners in various scientific, technical, and professional subjects men not otherwise connected with the Government service, who are recognized authorities in such subjects.

A typical examination in this class was that for quarry technologist, at a salary of $3,000 a year, in the Bureau of Mines. For this position it was necessary to secure eligibles having broad training and experience in quarry methods, with special reference to safety and efficiency in quarry operations and other technologic problems connected with the quarry phases of the mining industry. The person to be appointed was expected to undertake original investigations into the causes of waste in quarry operations and to suggest remedies. Applicants were required to furnish complete statements of their education and technical training, giving the names of the institutions at which they had studied either as undergraduate or graduate students, the time spent in each, the courses of study pursued, and the degree, if any, conferred. They were also required to furnish a complete statement of their practical experience, especially in quarry practice, and in the treatment and utilization of quarry products, including when, where, and by whom they were employed, and the specific nature of their duties in each case. They were further required to submit a list of their publications on quarry methods and quarry products. The above statements were all made under oath and subject to verification. The applicants were given a relative rating on the three subjects of (1) education and technical training, including postgraduate work, with a weight of 25 per cent; (2) technical and professional experience and fitness, with a weight of 45 per cent; and (3) publications on quarry methods and quarry products, with a weight of 30 per cent.

The constantly expanding activities of the professional, scientific, and research branches of the Government enlarge the demand for eligibles having unusual qualifications and experience. The range of these qualifications far exceeds university curriculums. There is difficulty in securing competent persons for many such positions owing to the competition of mercantile and manufacturing concerns, which are often willing to pay higher salaries than those offered by the Government. To meet this demand the announcements of the examinations set forth the unusual opportunity for research and broadening of training offered in the positions and not found in private employment. There has been a marked increase of late in the interest of the public in this class of examinations, as evidenced by the large number of requests for copies of the announcements, from the press as well as from individuals. These announcements are distributed to publications, educational institutions, and associations covering the particular field. Endeavor is made to learn the names and addresses of persons who have qualifications and experience of an unusual character, in order that when an examination is to be held persons likely to be interested may receive copies of the announcements.

The nonassembled examination meets the objection urged against examinations consisting of scholastic subjects—that they fail to test fitness where achievement and the personal element are important—and its development has equipped the merit system to handle presidential offices not closely connected with the policies of administration as rapidly as Congress and the President see fit to place them in the classified service. The President in his annual message of 1910 recommended such an extension of the classification; he has also, in a message to Congress, recommended the classification of assistant attorneys in the Department of Justice, and a high official of that department has stated that excepting only the position of Attorney General, a Cabinet office, there is no legal position which could not be better filled by competitive appointment or promotion than by the present method.

Rural Delivery Service.

The Rural Delivery Service, which was classified in 1902, now employs 42,081 carriers. Under the former regulations the department was not given a right of choice, but was required to appoint the eligible standing highest on the local register. It became evident that some latitude should be allowed in the selection of eligibles for appointment in this as in all other parts of the service. There are few branches of the public service the successful operation of which is so dependent on the personality of the employee. The greater part of the work of the rural carrier is done on his route away from the super-

vision of his superior officer and not in full view of the public as in the case of the city carrier. He is brought into direct contact with patrons and their families, and it is necessary not only that his behavior should make him worthy of their confidence but that his character and disposition should be such as to inspire it. If the patrons lack confidence in the carrier it will show itself in a diminution in the patronage of the route.

In view of these reasons the President, in an order of December 30, 1911, amended the rules to provide that three names should be certified for each vacancy. To guard against possible abuse of this right of choice, the order provides that all selections shall be made with sole reference to merit and fitness and without regard to political considerations, and that political recommendations shall not be considered but shall be returned to the writers. The rural carrier force is especially susceptible of being used for political purposes, and the order, while confirming the carrier's right to vote as he pleases and to express his opinion privately on all political subjects, forbids political activity under penalty of removal or other punishment, the recommendation as to the penalty to be imposed in each case to be made by the commission.

At the outset the examination required for entrance to this service was made very simple and transfers were not permitted to any other part of the classified service. Experience, however, convinced the Post Office Department and the commission that better results would be obtained by raising the standard of the examination, thus securing a more intelligent class of employees who could then properly be made transferable to the post-office service. This increases the flexibility of the service and affords opportunity of promotion after satisfactory service. The department and the commission accordingly, on February 19, 1912, adopted new regulations for the Rural Free Delivery Service embodying these changes.

Temporary Appointments.

During the year there was an increase of 1,256 (less than 7 per cent) in the total number of temporary appointments to competitive classified positions in the various branches of the service, the number being 19,813, as compared with 18,557 for the preceding year.

Although the total number of temporary appointments has increased, there has been a material decrease (over 13 per cent) in the number of such appointments in Washington, the number for the year being 1,547, as compared with 1,789 for the preceding year.

More than 75 per cent of these appointments were made from appropriate registers, and practically all of those not so made were to technical or other positions for which the commission is not able to maintain registers at all times.

Outside of Washington there was an increase in temporary appointments of about 9 per cent over the preceding year, due chiefly to temporary service in post offices during the holiday periods and to brief service in localities where, after due opportunity, persons failed to qualify.

With the exception of a few offices and establishments, temporary appointments to positions under the district system have decreased both in number and duration. On account of the difficulty in securing men for the position of stenographer and typewriter, temporary appointments to such positions have increased both in number and duration. Owing to the maintenance of lists of eligibles available for immediate temporary appointment at the locality where Government work is being done, temporary appointments to meet sudden emergencies may now be made, in many cases, of persons who have qualified in competitive examination.

A considerable number of temporary appointments has been occasioned in connection with a reorganization in some of the departments in the interest of efficiency and economy. Congress having abolished, under the recommendation of the heads of such departments, certain positions, the positions, however, to continue to the end of the fiscal year, the commission was requested to permit temporary appointments in vacancies naturally occurring from time to time in permanent positions, in order that such positions might be available at the end of the fiscal year for the retention of the most efficient employees whose positions were legislated out of existence.

The Apportionment.

One of the fundamental provisions of the civil service act is that appointments in the departments at Washington in the grades covered by the act shall be apportioned "as nearly as the conditions of good administration will warrant" among the several States and Territories and the District of Columbia upon the basis of population.[1] This provision is coordinate with the provision that selections shall be made "according to grade from among those graded highest as the results of * * * competitive examinations," and is not subordinate to any provision of the civil service act.

An experience of nearly 30 years has shown that it is not possible to maintain the apportionment with mathematical exactness, but it has been equitably maintained with respect to most of the States. A few have received relatively an excessive share of appointments;

[1] Civil service Rule VII provides that the following positions shall be exempted from the apportionment: Plate printer, printer's assistant, skilled helper, and operative in the Bureau of Engraving and Printing; positions in the field service of the military staff departments, and at Army headquarters, mail-bag repair shop, and mail-lock repair shop, Government Printing Office, Pension agency, and local offices in the District of Columbia; apprentice, student, gardener, engraver, carpenter, cabinetmaker, painter, plumber, plumber's helper, electric wireman, electric lineman, electrician's helper, and messenger boy.

this is notably true of Maryland, Virginia, and the District of Columbia. Reasons why it is not possible to make an exact apportionment are partly as follows:

1. When there are no eligibles from States having the least share of appointments it is necessary that vacancies be filled by the appointment of eligibles from other States. Eligibles possessing technical and scientific qualifications, having been lacking from certain States, and male stenographers and typewriters, for whom there is great demand, are obtained in relatively greater numbers from the States which tend constantly to excess in their allotment.

2. Whenever a person is reinstated in the apportioned service he is charged to the apportionment of his State, the reinstatement being allowed irrespective of the apportionment.

3. Preference in appointment is given by law to veterans honorably discharged for disability incurred in the line of duty, and they are certified for appointment before all other eligibles, irrespective of the apportionment, and their appointments are charged to the apportionment.

4. The effect of extensions of the classified service has been to give to some States, especially Maryland, Virginia, and the District of Columbia, further appointments in excess of their shares.

5. From May 29, 1899, to November 26, 1901, the rules provided that "the provisions in relation to apportionment shall be waived upon the certification of the appointing officer that the transfer is required in the interests of good administration." During the 30 months while this provision of the rule remained in force it resulted in approximately 130 charges to the apportionment of the District of Columbia alone.

Certain Southern and extreme Western States fail to supply eligibles in sufficient numbers to keep up their quotas. The largest relative number of applicants comes from the Middle-Northern States both east and west. The commission is constantly making every effort and resorting to every proper means to bring to the knowledge of citizens of States in arrears the opportunity for appointment which they have under the law of apportionment if they qualify in examinations. Pains is taken to emphasize the fact that applicants' political affiliations have nothing whatever to do with their examinations or certification for appointment.

There is nowhere a keener interest in Government positions or a greater effort to ascertain the needs of the service and to acquire those qualifications which are most in demand than among persons residing at the seat of government. This is due in part to the lack of commercial opportunities here. For some technical and scientific positions the commission is constantly obliged to certify eligi-

bles from the District of Columbia and States already in excess because of the failure of other States to provide sufficient eligibles.[1]

It is necessary to safeguard the apportionment by seeing that the persons appointed are genuine residents of the States they claim. An act of July 11, 1890, required that each applicant for the apportioned service should furnish a certificate of a county officer that he had been an actual and bona fide resident of the county in which he claimed residence for a period of not less than the six months next preceding. Soon after the passage of this act the Attorney General held that the commission was not authorized to go behind the certificate of the county officer prescribed by the statute; that the commission could do no more than to require such certificate to be furnished. It was further held, in effect, that this statute required only State citizenship or so-called legal residence. Congress not being satisfied with the operation of the statute of July, 1890, passed the further provision, July 2, 1909, providing that all examinations of applicants shall be had in the State in which the applicant resides, and that no person shall be eligible for examination or appointment unless he shall have been actually domiciled in the State for at least one year previous to examination.

It has been said that under the apportionment persons receive appointment who are inferior in qualifications to those who would be obtained if competition were as wide as the country; that the apportionment is distinctly an interference with the merit system, is inconsistent with it, and that it is harmful to the public service in that so far as it operates at all, the highest in the examinations often fail of appointment; that considered purely from an economical standpoint the apportionment can not be justified; that Government appointments should be distributed as far as at all practicable on a basis of efficiency, and that there is nothing in the natural distribution of population that corresponds to or coincides with the distribution of trained capacity.

The distribution of appointments among the States, however, is in accord with our federal system of Government, under which all the

[1] With the view of deferring the certification of eligibles with very low ratings from technical, scientific, and professional registers until practically all those with better ratings had been certified, the commission in 1910 established the following method of certification for scientific, technical, and professional positions and positions of stenographer and typewriter paying more than $900: Dividing the States and Territories into two groups, the first group constituted of those that have not received their proportionate share of appointments and the second group those that have received more than their proportionate share, certification is made in the following order: (1) All eligibles in order of average percentage from the whole group of States in arrears with averages down to and including 75; (2) in like manner from the whole group of States in excess except the two last States and the District of Columbia; (3) from the whole group of States in arrears down to and including 73; (4) in like manner as in (2) down to and including 73; (5) all remaining eligibles in order of average percentage from the whole group of States in arrears; (6) the same as (2) and (4) of all remaining eligibles; (7) in order of their standing under the apportionment from the last two States and the District of Columbia. For all other positions in the apportioned service certification is made in direct accord with the condition of the apportionment.

people from all the States are entitled to serve the Government. The requirement of an apportionment proceeds upon the theory that the competition for appointment is not from all the States together but from all those within each State separately, the Government being representative of the several States according to their population. A fundamental principle in the establishment of the Federal Government was not only the representation of every State but a representation which should embody an integral portion of the State itself. Thus Senators and Representatives are not chosen at large but must be inhabitants of the State in which they are chosen, an intended departure from the British system. The representative feature was established, based upon inhabitancy of the State as the nearest practical approximation to the personal participation of the whole people in the Government. The theory in the civil-service law is that every citizen, no matter how humble his condition or in what part of the country he may reside, may justly feel that as a citizen of a State he has equally with the citizens of every other State a commensurate interest and right to participation in the General Government. Thus it is regarded as an injustice by the people of a State or section of the country that another State or section should receive a share of this representation greatly disproportioned to its population.

President Washington enumerated among the three things essential in appointments that in as equal a proportion as might be they should be given to persons belonging to the different States in the Union. This principle of apportionment, opening to all the door to the public service, has been adopted by Congress upon every occasion where it would be applicable. Illustrations of this will be found in an act of 1875 relating to appointments in the Treasury Department, and in the laws regulating the apportionment of cadets at West Point and of midshipmen at the Naval Academy. Executive orders also require an apportionment of appointments among the States in the appointments made through examination in the Diplomatic and Consular Services. These laws and orders bear out the spirit and genius of our institutions—that this is a Government by the people acting through their several States, and that representation in the common Government shall be apportioned among the several States by their inhabitants serving in the legislative and executive departments, in the Army and Navy, and in our foreign services, all sections of the Union thus contributing to the labors of the Government.

Not only is this a matter of inherent right upon the part of the States, but it is in accord with a wise public policy and with the progress in education and patriotic achievement among the people of the several States. Distribution of appointments among the States brings to the seat of Government persons who represent the views of every community and who become acquainted with the operations

of the National Government, all sections of the Union thus participating in its work, and this in turn inspiring an interest therein among all the people. In this way every section, however remote, is brought into contact with the Central Government, intelligence and interest regarding its operations are diffused, patriotism promoted, the growth of sectionalism prevented, unreasonable prejudices overcome, and an enlightened understanding promoted respecting the aims and purposes of our common country. It is therefore the part of wisdom that to the people of every State should be secured the opportunity, as far as they are willing and as far as they can furnish the needed character and capacity, to enter a competition, not with people of other States but with people within their own States, to participate proportionately with the people of the other States in the conduct of the Government of which their State is a constituent.

In this gathering at Washington of clerks representing every part of the country, associated in the common business of Government, sympathetic relations are established and information diffused which extends to every part of the country, vitalizing the Central Government and securing popular support for it. If further reasons were necessary for a continuance of the apportionment provision of the law, there might be mentioned the possible effect upon the service of its discontinuance. If the apportionment provision were repealed, in the very nature of things an ever-increasing proportion of appointments would go to eligibles residing in the District of Columbia and nearby States. As such a condition continued and increased, it is believed the effect upon the service in the department at Washington would be seriously detrimental, occasioned by lack of general interest in such service and finally in consequent lack of adequate appropriations to carry it on.

Removals.

The rules are not framed on a theory of life tenure, fixed permanence, nor vested right in office. It is recognized that subordination and discipline are essential, and that therefore dismissal for just cause should not be unduly hampered. The rules have at all times left the power of removal as free as possible, providing restraints only to insure its proper exercise. In this way discipline is not impaired, just tenure is secured, and employees are protected against arbitrary removals. In other words, the public service is governed by the same theory as private service, in which tenure of place depends upon good behavior and efficiency, which are the mainspring of good service. The object in public as in private employment should be to secure good service and to reward fitness, experience, and tried abilities. At all times since the rules were established in 1883 the power of removal for unfitness has rested wholly with the

appointing officers for their free exercise. They are the sole judges of the qualifications of subordinates, and the question whether such cause exists as requires a removal for the efficiency of the service is for them to determine. Thus there has never been any foundation for the complaint that unfit men are "protected by the rules," that the rules establish a life tenure, or that persons who become inefficient are kept in office by the rules. The only restriction that has been imposed is that employees should not be removed for political or religious reasons or upon secret charges, and that for the same offense one employee should not be punished in a different manner from another.

On July 27, 1897, under the constitutional authority of the President, the rules were amended to require that before removal written charges should be filed with the head of the department, of which charges the accused should have full notice and to which he should have an opportunity to make defense. The courts declined to take cognizance of this provision and held that punishment for its violation rested solely with the President on the ground that the rule was not one which derived efficacy from the civil-service act. Thus the rule did not create any legal interest and could not be invoked by an employee before the courts. Appointing officers, therefore, are entirely free to make removals for any reasons relating to the interests of good administration, and they are made the final judges of the sufficiency of the reasons. No examination of witnesses or any trial or hearing is required except in the discretion of the officer making the removal. The rule is merely intended to prevent removals upon secret charges and to stop political pressure for removals. The commission is without authority to interfere, so long as the procedure required by the rule is followed, unless it is charged, with offer of proof, that a removal has been made for political or religious reasons or that unequal penalties have been imposed. No tenure of office is created except that based upon efficiency and good behavior; and it remains as much the duty of an appointing officer to remove a classified employee for inefficiency as it is not to discriminate against him in any way for political or religious reasons.

An amendment of the rules on November 17, 1905, made the serving of charges, with an opportunity of answer, discretionary instead of compulsory with the head of the department. This change did not appear to make any material difference in practice, since the departments continued to give reasons and to consider answers, except in cases where it was obviously unnecessary to do so.

On February 8, 1912, the President amended the removal rule, restoring the earlier requirements and providing that upon its request

the commission should be furnished with a copy of the record in any case of removal.[1]

Attempts by Employees to Influence Legislation.

The matter of attempts by Government employees to influence legislation is regulated by Executive order. The first Executive order on the subject was issued January 31, 1902, and was as follows:

All officers and employees of the United States of every description, serving in or under any of the executive departments, and whether so serving in or out of Washington, are hereby forbidden, either directly or indirectly, individually or through associations, to solicit an increase of pay or to influence or attempt to influence in their own interest any other legislation whatever, either before Congress or its committees, or in any way save through the heads of the departments in or under which they serve, on penalty of dismissal from the Government service.

Prior to the issuance of this order there had been in force for a number of years departmental orders which although not general in their scope were to the same intent. The order was amended on January 25, 1906, by the addition of the words "or independent Government establishments." An order on the same subject with the addition of a prohibition to the furnishing of information to Congress except through official channels was issued November 26, 1909, and is as follows:

It is hereby ordered that no bureau, office, or division chief, or subordinate in any department of the Government, and no officer of the Army or Navy or Marine Corps stationed in Washington, shall apply to either House of Congress, or to any committee of either House of Congress, or to any Member of Congress, for legislation, or for appropriations, or for congressional action of any kind, except with the consent and knowledge of the head of the department; nor shall any such person respond to any request for information from either House of Congress, or any committee of either House of Congress, or any Member of Congress, except through, or as authorized by, the head of his department.

These orders were criticized as being too stringent and an invasion of constitutional rights. On April 8, 1912, an Executive order was issued for their repeal, requiring that communications to Congress by employees should be transmitted through the heads of departments. The privilege of petitioning Congress or any of its Members is thus affirmatively declared and its method described.

It is hereby ordered that petitions or other communications regarding public business addressed to the Congress or either House or any committee or Member thereof by officers or employees in the civil service of the United States shall be transmitted through the heads of their respective departments or offices, who shall forward them without delay with such comment as they may deem requisite in the public interest. Officers and employees are strictly prohibited either directly or indirectly from attempting to secure legislation or to influence pending legislation, except in the manner above prescribed.

This order supersedes the Executive orders of January 31, 1902, January 25, 1906, and November 26, 1909, regarding the same general matter.

---

[1] In section 6 of the appropriation act for the Post Office Department approved Aug. 24, 1912, the requirement of the removal rule as to charges and hearing was enacted into law.

From its experience the commission does not believe that the purposes of the Executive orders are unwise or unnecessary. The personnel of the executive civil service comprises in the aggregate a very large body capable of wielding tremendous power, and if allowed to organize and become affiliated with other organizations having in view the change by statutes of their relations, their powers, or their compensations, the possible consequences are grave and far-reaching.

A man who assumes voluntarily a position of service with a multitude of others under the Government does so, prima facie, under obligation, real or implied, to do his duty according to the law and the direction of his superiors. He also takes an oath to the same effect and not to use his position as a menace directed toward any branch of the Government—executive, legislative, or judicial. All such persons are compensated and paid from the public taxes, and due economy should be observed and due regard had to the rights of the tax-paying public in their various compensations. These persons have a direct personal interest in increased compensation, in the shortening of the hours of labor, in the extension of leaves of absence, in the multiplying of vacations, and generally in diminishing the natural burdens of their offices, all at the expense of the taxpayer. Moreover, there seems to be a growing tendency to make the holding of public office, even of a subordinate kind, primarily for the benefit of the employee. The commission believes the true test for employment and compensation to be capability and efficiency, and that the authority and control over the personnel now vested in the Executive should not be withdrawn or diminished while he, the Executive, is held responsible for good administration.

All of these things taken together point to the desirability of regulating the unified power of a great body of men in their appeal to the legislative power or in their attitude toward the executive power. It has been the observation of the commission that without such regulation Members of Congress, committees of Congress, and the Congress itself are at times placed face to face with threats of personal defeat or with the promise of political allegiance upon the granting of the request of the organized power, whatever it may be; and so great and threatening had this condition become that the orders hereinbefore set forth were believed, at the time of their issuance, to be necessary.[1]

It may be added that the Executive orders quoted did not nullify the right "to petition the Government" guaranteed by the Constitution, but simply specified the procedure to be followed by executive employees of the Government in exercising this right.

[1] The Sixty-second Congress had this same matter under consideration, and in the Post Office appropriation act, approved August 24, 1912, the following provision of law was enacted:

"The right of persons employed in the civil service of the United States, either individually or collectively, to petition Congress, or any Member thereof, or to furnish information to either House of Congress, or to any committee or member thereof, shall not be denied or interfered with."

The District System.

There are approximately 236,000 positions in the classified service, of which 208,000 are in the field away from Washington. Of 105,000 persons examined for the classified service for the fiscal year ended June 30, 1911, but 19,000 were examined for the service in Washington. It will thus be seen that the commission needs to do a very large part of its work through agencies away from its main office, and at present for this purpose there are established 2,290 local boards of examiners outside of Washington. Originally there was a local board of examiners at each post office and at each customhouse, the membership of which was made up of persons detailed without additional pay from the offices in which they were employed. At first the amount of work required of these boards was small, but with the growth of the classified service it increased correspondingly, and in time the number of boards became so large that it was quite impossible for the commission to have any effective supervision of their work. Many of the offices at which local boards were established were never visited by representatives of the commission, and the only information the commission obtained of the work done there was by a system of reports, which were as a rule incomplete and unsatisfactory. At the larger offices so much of the time of the secretary of the board was taken up by the work of the commission that he was unable to give proper attention to his regular duties. In 1904 for administrative purposes the commission established 13 civil service districts, each district in charge of a representative of the commission designated as district secretary, the object being to relieve local boards of some of their duties and to allow a closer expert supervision over examinations and appointments in the field services, thus expediting the filling of vacancies, bringing about a better observance of the competitive system by local officers and applicants for examinations and securing closer cooperation with nominating officers.

The territory of the United States is at present divided into 12 districts, while two local boards are in charge of the work in Hawaii and Alaska. In Porto Rico Federal civil-service matters are cared for by the chairman of the Porto Rican Civil Service Commission, and in the Philippine Islands by the Director of Civil Service of the Philippine Islands. The commission at Washington remains the central organizing and directing body, keeping strict supervision over Federal work done under the district system. Examination questions are prepared at Washington, and all examination papers except those of the noneducational class are rated in the office of the commission; and here, too, all certifications and appointments to local Federal offices are audited. The cities at which are located district headquarters form centers of influence tending to promote public interest

in the practical working of the competitive system, and from these centers information regarding civil-service matters in general is readily disseminated to the public.

The district system has worked to the satisfaction both of the commission and of the departments, and is now well established. It has conduced to uniformity in the scope and character of examinations for similar positions in different parts of the service, each district secretary maintaining registers of eligibles in his district common for all positions for which the examination is appropriate. Certification of eligibles is made from these local registers by the district secretary direct to nominating officers in the field; these nominations are then forwarded to the respective departments for approval, and are finally audited in the office of the commission. By this means examinations are held for a local office in its vicinity, eligibles are certified who reside near by, and vacancies are filled without appreciable delay by the appointment of locally examined eligibles; all of which makes for stability in the personnel of the service.

The district secretaries visit, under orders of the commission, every main local board of examiners at least once in 18 months. In the 12 districts there are 2,130 of these boards thus visited, with 5,437 individual members, and in addition there are in the Engineer, Indian Irrigation and Allotment, Lighthouse, Ordnance, Quartermaster, Military Parks, Reclamation, and miscellaneous services 160 boards incidental to these special services, with 722 members, making a total in the field of 2,290 boards and 6,056 members (103 persons serving on more than one board.)[1]

Political Activity of Officeholders and Political Assessments.

During the past year there was a slight increase in the number of complaints received by the commission involving violations of the civil-service act and rules relating to political activity and assessments. This was but natural because of the presidential campaign. Comparing the number of employees in the service with the number of complaints received, it is gratifying to note that the political activity of classified employees has been very slight. This is due, no doubt, to the increased knowledge of Government employees respecting the rights and limitations of occupants of classified positions. There has been no coercion of much importance, and employees have been left free to vote as they pleased and to express privately their opinions on all political subjects.

In March, 1912, anticipating the primary elections, the commission issued a warning against activity in politics, which, at its request, was posted, by the direction of heads of departments, in the Federal

[1] This is of date June 30, 1912.

offices throughout the country. Many of the complaints received related to political activity of persons not in the competitive classified service. The commission is without authority to act upon complaints of the political activity of presidential officers or of employees holding positions excepted from examination unless they use their official authority or influence, by coercion or otherwise, to influence elections, or unless they violate the provisions of the criminal code relating to political assessments. The extent to which the competitive service has been taken out of politics was illustrated at Philadelphia, when, in the fall of 1911, during the municipal campaign, it was found by the committee of seventy that of 1,300 persons employed by the municipal and Federal Governments in that city who were charged with political activity only four were in the Federal competitive classified service. Upon investigation it was found that even as to these four the charges were not sustained. A similar condition was found to exist in the State of Kentucky, when, in the spring of 1912, a complaint was investigated alleging that Federal employees were unduly active in the primary campaign. Only one person, an assistant postmaster, was found to have violated the rule, the other persons being in the unclassified service and outside of the commission's jurisdiction.

The offenses alleged to have been committed by the complaints reaching the commission have, in almost all cases, involved only minor infractions of the rule. There were, however, a few cases of more than ordinary importance. In North Carolina a number of Federal officeholders were members of campaign committees in 1910, and their names appeared on letterheads used in soliciting political contributions from other persons in the Federal service. By an opinion of the Attorney General rendered October 17, 1902 (24 Op., 133), it was held that such letters bearing the names of Federal officials should not be sent to persons in the Federal service, being unquestionably condemned by section 11 of the civil-service act, now section 118 of the Criminal Code. As a result of an investigation these officials withdrew from the committees and no further instance of this character has been reported from that State.

In Woodbury, N. J., it was found that a letter carrier had, while a substitute in 1909 and 1910, belonged to a committee or association which was engaged in handling funds for political purposes. The acts committed by this carrier were clearly in violation of section 1 of civil-service Rule I as well as of the election laws of his State. The facts were presented to the Post Office Department and the carrier was removed from the service. A clerk in the Chicago post office had been a candidate for and elected as precinct committeeman at the primaries in the spring of 1912. This clerk declared that he had never seen any warning against activity in politics, although it was

clearly established that a warning issued by the commission was conspicuously posted in the workrooms where he was daily employed. He declared that he intended to serve as committeeman in his precinct, and upon request by the commission the department directed that he be removed from the service, but upon a reconsideration of the case and viewing his long and faithful service, the punishment was subsequently modified to a reduction in salary from $1,200 to $900 per annum upon his promise to refrain from political activity of every kind.

In the State of Alabama in the summer and fall of 1910, during the State campaign, the manager for one of the candidates for governor wrote letters to Federal officeholders, soliciting contributions. These letters were written to postmasters, assistant postmasters, clerks and carriers in post offices, United States marshals and their deputies, and employees of the customs service throughout the State. They were received in most instances in Government buildings, and when they failed to produce the desired result the campaign manager or his assistant would communicate by telephone with those who had not contributed and urge them to give certain stated sums—in some cases 5 per cent of their salaries—to defray the expenses of the campaign. Most of them were circular letters, but in some cases special letters were sent out, wherein it was stated that—

> The administration representatives in Alabama have shown very little appreciation of the positions they hold and their obligations to assist their party—

And—

> We feel that in view of the position you hold, that you should feel disposed to add to your subscription in a liberal manner. Kindly let us have your check by return mail.

The evidence obtained in the investigation was presented by the commission to the Department of Justice, with the recommendation that the campaign chairman and his assistant be prosecuted for violating section 12 of the civil-service act (section 119 of the Criminal Code). An indictment was returned by the grand jury, the two persons accused entered pleas of guilty, and a fine of $50 in each case was imposed, which was subsequently reduced in one of the cases to $25.

At Cohoes, N. Y., an investigation was conducted into charges of political assessments on the part of the postmaster and the assistant postmaster. Sworn statements were obtained from employees in the post office and from the postmaster and his assistant. The two officials admitted that they had committed acts constituting violations of sections 118 and 119 of the Criminal Code, and the commission presented the facts to the Post Office Department, with the request that they be dismissed from the service, and to the Department of

Justice for appropriate action. In April, 1912, a grand jury at Syracuse, N. Y., by a unanimous verdict, found a true bill against both of these officials for violating section 118 of the Criminal Code. At the time this report is written the case is still pending. The facts ascertained by the commission were promptly laid before the Post Office Department. In July, 1912, it was learned that the postmaster had been nominated to succeed himself, and the commission presented the facts to the President, which resulted in the withdrawal of the nomination pending the trial of the indictment.

Some important changes in the administration of the civil-service act and rules on the subject of political activity have been made within the past year. In 1908 the commission adopted the policy outlined in the following minute:

> Inasmuch as the issuance of a certificate is discretionary with the commission, no certificate will be issued in any case where the party applying for reinstatement has previously resigned with a view of running for office, or with a view of indulging in a degree of political activity which would be prohibited if he had remained in the service, and who afterwards, having failed in his candidacy or having indulged in the contemplated activity, seeks reinstatement.

The President in 1908 approved this policy and directed the heads of departments to put it into effect.

In June, 1911, a case arose which was presented by the Post Office Department. A clerk in the New York post office had resigned in October, 1910, to become a candidate for State office. He failed in his candidacy and requested to be reinstated. Doubt arising as to the action to be taken, the commission submitted the case in December, 1911, to the President, giving a history of the adoption and enforcement of the regulation and requesting instructions whether it should adhere to the former policy and procedure or whether a person who resigns to become a candidate for office and pursues a course free from coercion, bribery, or other scandalous and unlawful conduct should be allowed reinstatement. On December 26, 1911, the President replied in part as follows:

> I am of opinion that in accord with the spirit of our institutions in recognizing the fundamental right of citizenship, a citizen who resigns to become a candidate for office and pursues a course free from coercion, bribery, or other scandalous or unlawful conduct should not thereby be prejudiced by being refused reinstatement within the period of eligibility prescribed by the rules; nor do I think any distinction should be made between the person who resigns and becomes a candidate and one who resigns, not to be a candidate, but to manage or take part in a political campaign for a party. If he wishes to run the risk of finding an executive who will reinstate him, and he resigns in order to avoid a violation of the rules as to participation in electoral contests by members of the classified service, I do not see why it should demoralize the service to allow him to resign and run the risk of securing the approval of his reinstatement by the executive within a year after he has resigned.

The holding of municipal or State offices by persons in the Federal service, besides involving possible political activity, is, with certain

express exceptions, prohibited by an Executive order of January 17, 1873. On February 14, 1912, the President issued an Executive order permitting employees of the executive civil service permanently residing in the following incorporated municipalities adjacent to the District of Columbia to become candidates for or to hold municipal office in such corporations:

In Maryland: Takoma Park, Kensington, Garrett Park, Chevy Chase, Glen Echo, Hyattsville, Mount Rainier.

In Virginia: Falls Church, Vienna, Herndon.

In the order mentioned it was provided that in the exercise of the privilege granted thereby officers and employees must not neglect their official duties and must not engage in National, State, or county political activity in violation of the civil-service rules, and that if there should be such violation the head of the department or independent office under which the person was employed should inflict such punishment as the commission should determine. This order, which was recommended by the commission, was based upon the facts that a considerable number of the residents and taxpayers of the towns mentioned were employed in the Government service; that service as municipal officers in such towns should in no way involve general partisan political activity; and that the principle of home rule and local self-government justified such participation.

It is to be understood that the exception made in this case does not extend to municipalities other than those specifically named, and Government employees residing in other towns than these who desire to become candidates for local office or to take an active part in political campaigns are not permitted to do so.

Another exception was that relating to the temporary office of moderator of a town meeting. The commission had previously held in numerous cases that the office of moderator was one that should not be sought or held by a competitive classified employee. The President, however, on August 24, 1912, issued the following Executive order upon the subject:

The temporary office of moderator of a town meeting and offices of a like character are hereby excepted from the operation of the Executive order of January 17, 1873, prohibiting persons in the Federal civil service from holding office under the charter or ordinances of any municipal corporation, and may be held by persons in the executive civil service. Membership in the civil service ought not to prevent an employee from taking part in the ordinary municipal affairs of the community in which he lives, where that part does not involve permanent service but only such a temporary duty as that of acting as chairman of a municipal business meeting where such service is not compensated by any salary or other emolument, and where the attention required by such service does not interfere with the regular and efficient discharge of the duties of the Federal office held.

In the exercise of the privilege granted by this order officers and employees must not neglect their official duties and must not engage in national, State, or county political activity in violation of the civil-service rules; and in seeking the local offices

named or in performing the duties thereof employees shall not use the authority or influence of their Federal positions, nor take an active part in political management or in political campaigns.

The jurisdiction of the commission in cases of political activity was considerably widened by two Executive orders, the first dated December 30, 1911, relating to the appointment of rural carriers, and the second, already considered, dated February 14, 1912, relating to the political activity of Government employees residing in certain towns adjacent to the District of Columbia. In both of these orders it was directed that the persons involved, if they transgressed the limits set by the order and by the rules, should be punished by removal from the service or by other discipline in accordance with such recommendation as might be made by the commission. These are the only instances in which the commission has authority to prescribe penalties.

In the appendix of this report will be found a digest of the principal cases of political activity and political assessments that have been investigated since the last report.

Increased Efficiency from the Merit System.

The number of appointments, through competitive examination, has grown year by year, and there is abundant evidence that in those parts of the service to which the civil-service law has been applied the Government has been enabled to effect large savings. More is being done with fewer employees and done far more economically.

In a message to Congress dealing with the loss to the Government from the present patronage method of filling the higher unclassified positions, the President states that the loss amounts to at least $10,000,000 annually, and that "it is not to be doubted that where no saving would result the classification of the local officers would increase the efficiency of the service." Illustrations of increased economy and efficiency due to the merit system are given in the commission's previous reports. The annual reports of the Commissioner of Internal Revenue afford the following comparison between present conditions and those which prevailed when the merit system was first applied to the Internal-Revenue Service:

	Fiscal year ended June 30, 1912.	Fiscal year ended June 30, 1896.
Total collections	$321,615,894	$146,830,615
Total expenses	$5,509,983	$4,086,292
Cost of collection per $100	$1.71	$2.78
Number deputy collectors employed	1,257	962
Number clerks employed	129	185
Number messengers employed	14	27
Salaries paid deputy collectors, clerks, and messengers	$1,818,239	$1,504,186
Number gaugers, storekeepers, and storekeeper-gaugers	2,172	2,551
Number gallons gauged	544,020,347.3	269,334,762

RECLASSIFICATION OF SALARIES ON THE BASIS OF WORK PERFORMED.

A reclassification of salaries on the basis of work performed is absolutely necessary and essential to any plan of retirement or further satisfactory and efficient reforms in the service. The salaries need to be related to duties not merely in the same department, but throughout the departments, thus treating the Government service as a whole. Until reclassification is effected it will not be possible properly to adjust salaries on any uniform basis, to legislate suitably upon the conditions of employment, or to provide equitably for superannuation.

PROPOSED EXTENSIONS OF CLASSIFICATION.

LOCAL PRESIDENTIAL OFFICERS.

The same reasons which require tests of merit for entrance to competitive positions apply even more strongly to such of the higher positions as have nothing to do with the policies of the administration. These positions are chiefly those of first, second, and third class postmasters, collectors, and other chief officers of customs and internal revenue, district attorneys, marshals, and registers and receivers and surveyors general and heads of bureaus in the departmental service. The President has earnestly recommended in messages to Congress of December 21, 1911, January 17 and April 4, 1912, that legislation be enacted under which these positions may be classified and open to promotion, or, in the rare cases where this is not practicable, to be filled by open competitive examinations, and bills were introduced in Congress to this end. The text of the pertinent portions of these messages will be found in the appendix of this and the preceding report.

As long as so large a proportion of the higher administrative positions remain unclassified, to be filled from the outside without promotion, the classified service will not offer a career in competition with such outside fields of employment as are organized and conducted upon a merit basis and which have systems of retirement upon disability or superannuation. In this respect the civil service remains inferior to the service of many business establishments which assure promotion for merit to the high-salaried positions and which give retiring allowances; and the Government can not hope to secure and retain the services of an equally intelligent and ambitious class of persons while these conditions exist. The fact that higher positions are not open to promotion deters many of the better class of men from entering the examinations for appointment. Moreover, there is an increasing tendency on the part of the most capable persons who enter the service to resign for employment in fields in

which there is better organization and greater opportunity for advancement. This constant depletion of the service means serious financial loss to the Government. The civil service is inferior to the military and naval services in this regard, since it does not offer the same opportunities of advancement and of retirement.

Again, where the higher positions are filled by political influence and when the men filling them are, as they generally are, active in political work, it is inevitable that the minor force will fall under detrimental political influences.

A leading journal in a recent editorial emphasizes the fact that the classification of the higher offices in the Federal service is of an importance which can not be measured by numbers. It says:

> The higher posts, while the number of them is small in comparison with the vast aggregate of offices, are of an importance which can not be measured by numbers; and this not only because the duties of these posts are of great moment, and because of their tempting character as political prizes, but also for a reason profoundly affecting the service as a whole. A few offices, involving questions of governmental policy, should always remain subject to untrammeled appointment by the executive head of the Government; but purely business offices of high order, such as the first-class postmasterships, should become the natural goal of the men filling the lower places in the same branch of the service. Only so can the Government service in general become a true career for men of ability; and the effect of its being such a career would be felt in a most beneficent way throughout all the grades. President Taft has urged upon Congress the most comprehensive legislation to this end; in default of such legislation he can do nothing, since the offices in question are, under the law, filled by the President "by and with the advice and consent of the Senate."

The Encyclopædia Britannica under the title "Civil service" says:

> * * * The chief drawback to the full success of the (civil service) act within its intended scope of operation has been the withholding of certain positions in the service from the application of the vital principle of competition. The civil-service act contemplated no exceptions, within the limits to which it was made applicable, to the general principle of competition upon merit for entrance to the service. In framing the first civil-service rules, however, in 1883, the President, yielding to the pressure of the heads of some of the departments, and against the urgent protest of the Civil Service Commission, excepted from the requirement of examination large numbers of positions in the higher grades of the service, chiefly fiduciary and administrative positions such as cashiers, chief clerks, and chiefs of division. These positions being thus continued under the absolute control of the appointing officer, the effect of their exception from examination was to retain just that much of the old or "spoils" system within the nominal jurisdiction of the new or "merit" system. Under the old system, while appointments from the outside had been made regardless of fitness, still those appointments had been made in the lower grades, the higher positions being filled by promotion within the service, usually of the most competent, but under the new system with its exceptions, while appointments to the lower grades were filled on the basis of merit, the pressure for spoils at each change of administration forced inexperienced, political, or personal favorites in at the top. This blocked promotions and demoralized the service. Thus, while the general effect of the act was to limit very greatly the number of vicious appointments, at the same time the effect of these exceptions was to confine them to the upper grades, where the demoralizing effect of each upon the service would be a maximum. * * * Thorough civil-service reform

requires that these positions (postmasters and collectors of customs and of internal revenue) be made subject to the merit system, for in them is the real remaining stronghold of the spoils system. Even though all their subordinates be appointed through examination, it will be impossible to carry the reform to ultimate and complete success so long as the officers in charge are appointed mainly for political reasons and are changed with every change of administration.

EMPLOYEES OF THE DISTRICT OF COLUMBIA.

Of the 15 cities with larger population than Washington, only 3 have no civil-service law; in two of these 3 cities the competitive system is applied in part, and in the third a civil-service law was passed but was held unconstitutional. The commission repeats its recommendation for the classification of the employees of the District of Columbia in order that they may be placed upon the same stable footing as employees of the General Government and of other large cities.

EMPLOYEES OF THE LIBRARY OF CONGRESS.

The Library of Congress is under the control of a joint committee of Congress upon the Library, and this control is almost exclusively of a legislative character. Section 68 of the Revised Statutes provides that "the President shall appoint from time to time a librarian to take charge of the Library of Congress," and section 91 of the Revised Statutes provides that "the Librarian of Congress is authorized to employ from time to time" assistants in the business of the Library. The positions in the Library of Congress are of the same general character as those in the different departments for which examinations have been successfully provided. The departments at times need employees who have been trained in the Library of Congress, and such persons are not eligible for transfer. The commission, with its facilities for examinations, can fully meet the needs of the Library of Congress and probably obtain a better class of employees than can be obtained under any system not so well organized. Classification of the employees, which would render them eligible for transfer, would undoubtedly be of benefit to the departments. If such classification is not now permissible, it is recommended that appropriate legislation be enacted to accomplish this result.

The Official Register and the Service Records of the Commission.

The earliest issue of the Official Register, published in 1816, contained less than 6,500 names and was not larger than a stenographer's notebook. In 1905 it had increased to two ponderous volumes containing nearly 350,000 names. Meanwhile the actual cost of printing it had increased from less than $4,000 to more than $70,000. With the 1905 issue it was obvious that the limit had been reached

both in size and cost. In 1907 the practice of grouping employees by departments, offices, and classes, and referring to them by an index was discontinued, and the names of employees appeared only once, in strict alphabetical order, with the information required by law following each name in highly abbreviated form. This change diminished the size of the register and the cost of printing by more than half, but it rendered the register utterly worthless for statistical or comparative purposes, the arrangement being solely alphabetical.

An up-to-date card record containing the information which the statutes require the Official Register to contain would be preferable. The great objection to the Official Register is that it shows the condition of the service for only one day in two years, and by the time it is published that day is several months in the past. The rapid changes in the service cause a correspondingly rapid deterioration in the usefulness of the register.

This commission is so situated that it could prepare and maintain such a card record at greater convenience and less expense than any other office under the Government. It necessarily maintains service records of all employees subject to civil-service rules, which records are revised to agree with monthly reports of changes. At a comparatively slight additional expenditure of time and labor it would be possible to establish and maintain record cards of the diplomatic and consular services, the legislative service, the judicial service, and changes in the force of officers appointed by the President and confirmed by the Senate. If this were done a complete up-to-date Official Register of the United States would exist in card form at all times in the office of the commission available for official use and replies to legitimate public inquiries.

In view of the great development of means of instantaneous communication since the original provision for the Official Register and the ease with which any desired information might be obtained from the commission, it would perhaps not be necessary to continue the publication of the register; or, if published, its contents might be limited to a list of the higher offices and employees of the service, with a tabulation of positions by class and departments, instead of the enumeration of the names of hundreds of thousands of employees as heretofore.

The most recent bill in Congress on the subject provides for the publication of an annual return by name of the most important officials in all branches of the Government service and a statistical treatment of the civil service as a whole. Such a publication would give a general view of the organization of the Government, and the commission hopes that some such bill may become a law.

Civil Service in the Philippines and Porto Rico.

The commission has continued to render all practicable assistance to the Philippine Bureau of Civil Service and the Porto Rican Civil Service Commission, as required by the rules, and to conduct examinations in the United States for positions in the Insular and Federal services in the Philippines and Porto Rico which can not be adequately filled as the result of examinations held in the islands. These examinations are principally for technical, scientific, and the higher grade administrative positions.

From the report of the Philippine Bureau of Civil Service for the year ended June 30, 1912, it appears that during the year there were 7,422 persons examined, an increase of 437 over the number examined during the preceding year, due, as in preceding years, almost entirely to the increased number of Filipinos examined in English. Every effort is being made to eliminate Spanish examinations as far as practicable, the second and third grade examinations in Spanish not being given at all to residents of Manila. There were Filipino competitors in every examination given in the islands except those for fiber expert, trained nurse, and veterinarians; and of the persons examined 79 per cent were Filipinos examined in English, the number so examined exceeding that of any previous year. There was a large increase in the number of appointments made during the year ended June 30, 1911; and a decrease during the present fiscal year, due entirely to the decrease in the number of Americans appointed. Generally speaking, about 50 per cent of those who pass examinations in the Philippines are appointed. The number of appointments made in the United States to the Philippine service during the fiscal year 1911 considerably exceeded that of the preceding year, but was less than in 1908; and in the present year the number of appointments to the classified Philippine service made in the United States was 243, 25 less than in 1911. The policy is to appoint Filipinos wherever possible, and no persons are appointed in the United States except to positions which can not be adequately filled by Filipinos or Americans resident in the islands, the more important positions of this class, so far as the number appointed is concerned, being those of teacher, civil engineer, surveyor, and certain scientific positions. The proportion of Filipinos in the entire service is steadily, though slowly, increasing, having increased from 64 to 65 per cent during 1910 and from 65 to 69 per cent during 1911. The percentage of permanently appointed Americans separated during the fiscal year 1911 by resignation or otherwise was 21 per cent of the total American force, and in 1912, 17 per cent. The numerous resignations of competent and experienced Americans are a matter of concern to the Philippine Government.

In addition to the existing liberal leave and traveling expense allowances and the excellent opportunities for advancement which have attracted an unusually honest, intelligent, and efficient body of young men to the Philippine service in the past, the executive and legislative branches of the insular government have under consideration a retirement system calculated to retain them for longer periods of service. Statistics were prepared during the year showing the average length of service (of Americans and Filipinos) to be four and one-half years, and the average age 31 years, there being only 76 persons more than 55 years of age.

The Philippine Assembly has on several occasions shown a disposition to legislate respecting the civil service law, and bills injurious to the merit system have been introduced in, or passed by, that body, but have not been passed by the Philippine commission and consequently have not been enacted into law.

In this commission's preceding report reference was made to the difficulties encountered in enforcing the civil service law in Porto Rico, and a case was mentioned wherein the district court of Porto Rico granted an alternative writ of mandamus directing the Civil Service Commission to hold a competitive examination for the position of superintendent of public works, and to notify the auditor and the paymaster of the island that the incumbent of that position, having been appointed without regard to the civil service act and rules, was not legally appointed, with which order of the court the Porto Rican commission complied. The auditor and the paymaster, basing their action on an opinion of the attorney general of Porto Rico holding the civil service act unconstitutional, advised the commission that the salary of the incumbent would continue to be paid. This will indicate the unsatisfactory status at the present time with respect to the Porto Rican civil service law. The Federal positions in the island, of course, are subject to the Federal civil service law. In his report for the year ended June 30, 1911, the Secretary of War refers to this matter as follows:

> The organic act of Porto Rico was silent as to civil service. Civil service in Porto Rico is therefore governed by an act of the Porto Rican Legislature, which has proved to be unworkable.
>
> A sound, vigorous civil-service system has from the beginning been deemed a fundamental need in the successful administration of our insular possessions. Time has certainly not lessened the need. The head of the civil service in Porto Rico should be appointed by the President, so as not to be dependent for his position upon local influences. The rules of the civil service should be made by him, subject to the approval of the President.

The Secretary then quoted a provision of law recommended by his predecessor, and expressed the opinion that if enacted it would satisfactorily meet the necessities of the Porto Rican Government. This recommendation is similar to that made with reference to the Philip-

pine civil service by the director of civil service in his report for the year ended June 30, 1908, as follows:

The opposition of some officials to the present effective civil-service law, due either to failure to grasp its intent and to realize the necessity for its strict enforcement or to actual preference for the patronage system, is certain under existing conditions seriously to endanger the merit system in the Philippines. In view of the efforts heretofore made to modify the Philippine civil-service law so as to render it ineffective as a merit-system measure, and of the prospect of the more successful renewal of such efforts in the absence of restraining influences, some directive action by the Federal Government is evidently necessary to insure at least a continuance of that measure of good government in the Philippines heretofore attained. It has become quite evident that to prevent the further growth and development of the patronage system in the Philippine Islands the regulation of the Philippine civil service should be placed in the hands of the United States Government. The control and regulation of the civil service in the dependencies of European countries have always been maintained by the home government.

I have reached the conclusion that an organic law relating to the Philippine civil service should be enacted by the Congress of the United States, in which provision may be made for the promulgation of rules by the Governor General, subject to the approval of the Secretary of War.

In the Philippines and in Porto Rico experience has shown the need of freedom from local interference and obstruction, and remedial legislation along the lines set forth above is desirable.

Popular Approval of the Merit System.

The development and improvement of the practical methods of the merit system in recent years have been rapid not merely in the Federal service, but in the great municipalities of the country. Of the whole number of public employees in the United States—Federal, State, county, municipal, and village—not far from 600,000, or nearly two-thirds of the entire number, are withdrawn from the spoils system and appointed upon a merit basis, under laws intended to regulate and improve the public service. The experience obtained in the administration of the merit system by more than 200 civil service commissions under varying conditions has demonstrated the value and the success of the system in obtaining well qualified persons for all classes of positions, including the higher expert positions.

The popular approval of the system of competitive examinations as a means of producing increased economy and efficiency and of suppressing abuses due to improper political influences is shown in the platforms adopted by the different political parties during the campaigns of more than a quarter of a century. The principles of the competitive system are approved by the whole country without distinction of political faith. This unanimity indicates that the American people are satisfied with the results of the system and marks the cessation of all organized opposition to it.

Comparative Cost.

The comparative cost of the civil-service commissions in the United States, Great Britain, Australia, and other countries is here given as having an important bearing upon the work in the United States:

BRITISH SYSTEM.

Statistics of the work of the British commission and its cost show the actual amount of money spent by that body. The following table contains the expenditures for that commission for the year 1910–11 and the estimates for the year 1911–12. It is to be noted in considering the estimates that in practice there is really no difference between the estimates, which compose the budget of the civil list, and the subsequent appropriations by Parliament:

	Estimates, 1911–12.	Expenditures, 1910–11.
Salaries, wages, and allowances	$106,460	$101,840
Assistant examiners	104,500	75,750
Other expenses	94,775	90,870
Total	305,735	268,460

The number of candidates examined by the British Civil Service Commission for the year 1910 was 49,620. Bearing in mind that the British commission's work is that of an examining body, that it has nothing to do with the administration of the service in any respect, and that it has nothing to do with the candidate after his papers have been rated and his rating listed, it will be easy to calculate what it costs in the British service to examine each candidate who presents himself for examination. Taking the expenditures for the year 1910–11, namely, $268,460, and dividing that number by the number of candidates examined, namely, 49,620, we obtain a quotient of $5.41. That is, in 1910 it cost $5.41 to examine each candidate for the British civil service.

Attention is invited to the fact that the expenses of the British commission are greatly limited because examinations are held mainly in three places in the United Kingdom, namely, London, Edinburgh, and Dublin. Under the United States Civil Service Commission examinations are held in more than 2,000 cities and towns.

The salaries paid to the principal officers of the British Civil Service Commission are as follows:

First commissioner	$7,500
Commissioner	6,000
Secretary and registrar	4,500
Assistant secretary	3,750
Senior assistant examiner	4,500
Assistant examiners, each	3,000
Permanent assistant to the examiners	3,000
Senior clerks, each	3,500

AUSTRALIAN SYSTEM.

A similar comparison for the civil service of the Commonwealth of Australia is not possible, because the public-service commission for that country, in addition to being an examining body, also performs other duties somewhat along the lines of the United States Civil Service Commission; and then, too, it has important administrative duties and powers distinctly beyond those of the United States Civil Service Commission. Some figures, however, can be given which show the cost of administering this class of work in the Commonwealth. The total number of employees in the service there is 15,120. The total number of persons examined during the year ending in May, 1911, was 8,228. The expenses of the commission during the fiscal year 1911 were $85,250. The principal officers are:

Public service commissioner	$6,000
Six inspectors, each	4,200
Secretary	2,695
Registrar	2,195

There is nothing upon which to base a division of the cost of examining applicants as distinguished from the cost of administering the service; but, as stated above, there are in the entire service of the Commonwealth only 15,120 officers and employees. However, if only 50 per cent of the expense were devoted to the examination of applicants, the cost of examining each applicant would be $5.18.

OTHER COUNTRIES.

Great Britain and Australia are the only countries about which the commission has statistics available on the subject of the cost of securing employees for the public service. In France there is no general civil-service law, and the several ministries, corresponding to our departments, hold examinations for their own service; while in Germany, Italy, and the Netherlands the merit system is in vogue, with a central system of examinations. These seem to be fairly thorough, but no statement is made as to their cost. In other European countries examinations are held for only a part of the service. In several of the British colonies civil-service systems exist, but the number of employees not being stated and the appropriations not being given, no comparison with the cost of the United States system can be made.

UNITED STATES SYSTEM.

In the United States the cost to the Government of examining applicants is about $2.16 each. After appointment the expense of the administration of the law and rules is about 29 cents for each employee in the classified service, such administration including

supervision of promotions, transfers, and other changes of status of persons already in the service, and of the enforcement of the provisions of law relating to political assessments and proscribed political activity. The total annual appropriation for the commission for all purposes is about one-tenth of 1 per cent of the annual appropriation for salaries of employees in the competitive classified service. It will thus be seen that the cost for each individual employee withdrawn from the spoils system and put in the classified service is very small.

This brief comparison indicates clearly that civil-service administration in the United States covers a wider field of operations and at a far less cost to the Government than it does in any other country.

We have the honor to be, very respectfully,

JOHN C. BLACK,
JOHN A. MCILHENNY,
WM. S. WASHBURN,
Commissioners.

The PRESIDENT,
The White House.

To so much of this report as relates to retirement and superannuation I do not subscribe.

JOHN C. BLACK.

REPORT

OF THE

INTERSTATE COMMERCE COMMISSION.

WASHINGTON, D. C., *December 16, 1912.*

To the Senate and House of Representatives:

The Interstate Commerce Commission, pursuant to the requirements of the act to regulate commerce, presents its twenty-sixth annual report to the Congress.

The work of the Commission during the current year has been of the same general character as during the preceding year, but of somewhat greater volume.

INFORMAL DOCKET.

When an informal complaint is received in reference to any matter within the jurisdiction of the Commission it is taken up with carriers by correspondence and an adjustment reached if possible. These complaints are given a number upon what is known as the informal docket of the Commission. During the past year 6,550 complaints have been so docketed, an increase of 2,225 over the preceding year.

SPECIAL DOCKET.

Upon our special docket, which covers applications by carriers for leave to refund to shippers amounts which have been collected in accordance with tariffs conceded to be for one reason or another unlawful, 6,009 applications have been filed during the year, an increase of 356 over the preceding year. Upon this docket orders have been issued during the year in 3,096 cases, awarding reparation in the sum of $295,011.93, a decrease of $34,376.33 as compared with the previous year. During the current year 799 cases have been dismissed or otherwise disposed of without the making of orders for reparation.

FOURTH SECTION DOCKET.

During the year 1,993 applications have been filed for relief from the provisions of the fourth section.

For the same period 1,828 orders have been issued, of which 1,587 grant relief—for the most part temporary, pending further investigation—while in 241 relief is denied. A brief reference to this part of our work appears in another portion of the report.

INVESTIGATION AND SUSPENSION DOCKET.

The act of June 18, 1910, gave the Commission power to suspend the operation of a tariff which had been filed but had not taken effect. The same act required the Commission to give special expedition to the hearing of such cases. We have established what is known as the investigation and suspension docket for this class of cases exclusively. Up to the date of this report 189 proceedings of this character had been undertaken in all, and of these 120 were instituted during the current year. Of the total of 189 proceedings, 99 have been disposed of. In 22 instances the tariffs under suspension were voluntarily withdrawn by the carriers. In 30 instances the advances were allowed as filed; in 15 instances they were allowed in part; and in 32 the advances were disallowed.

Reference to the work of the Commission under this docket will be found at a subsequent page of the report.

FORMAL DOCKET.

The number of formal complaints filed during the year is 755, a decrease of 126 as compared with the previous year. During the same period 640 cases have been decided and 138 have been dismissed by stipulation or otherwise, making a total of 778 cases disposed of during the year, as compared with 652 during the previous year, an increase of 126.

During the year the Commission has conducted 1,154 hearings, as compared with 943 hearings during the previous year, in the course of which approximately 125,000 pages of testimony have been taken, an increase of 30,000 pages.

INVESTIGATIONS OF COMMISSION.

The Commission has authority under the statute to undertake, upon its own motion, proceedings of investigation into the rates and practices of carriers and to issue orders as a result of such proceedings to the same effect as though formal complaint had been filed. This part of our work has recently increased in amount and in significance.

The most important investigation of this kind is the express inquiry, which has been practically concluded during the year. There were pending upon our docket a considerable number of cases attacking the rates and practices of express companies in all parts of the country, and in addition to that the Commission had received many protests from shippers to the same general effect. A general proceeding of inquiry was ordered, into which all the complaints pending were merged.

That investigation was conducted at great length, in very great detail, and with all possible thoroughness. As a result, it appeared

that many of the practices of express companies were utterly inexcusable, that their methods were archaic, their rates discriminatory and unreasonable. The report of the Commission has worked a revolution and renovation in the methods and rates of express companies. The double collection of charges has been prevented, discriminatory rates have been or will be abolished, through routes have been and are being established which will secure a direct and properly expeditious service, and a new and original system of stating express rates by blocks has been devised and will soon be put into operation, under which it will be possible not only for the express agent himself, at a given station, to determine at a glance the rate between his office and every other express office in the United States, but even the shipper can qualify himself by a few moments' study to ascertain the same facts.

This is probably the most important single piece of work ever done by the Commission, and is an illustration of the kind of constructive work by which this body can be of most assistance, both to the shipping public and to the carriers.

Similar investigations are now in progress upon various matters, including the substitution of tonnage in transit; allowances to terminal railroads; the weighing of carload and less-than-carload freight; the issuing and use of passes, franks, and free passenger service; bills of lading; private cars; rates on anthracite coal, etc. These investigations are of necessity largely conducted by the members of the Commission in person, and occupy a very considerable portion of our time.

RATE SCHEDULES AND APPLICATION OF RATES.

During the 12 months ended November 30, 1912, 108,766 tariff publications containing changes in rates, fares, or charges were filed with the Commission. This record shows that the steady decrease in the number of such publications filed since the promulgation and enforcement of the Commission's rules and regulations governing the construction and filing of tariffs continues. The general tendency is still toward the publication of more comprehensive tariffs and corresponding discontinuance of small miscellaneous tariffs, as is indicated by the following table covering the last five years:

Schedules filed.

	Number.	Less than in 1908.
1908	228,403	
1909	184,303	44,100
1910	154,588	73,815
1911	121,829	106,574
1912	108,766	119,637

Following the decision of the Supreme Court in the Humboldt Steamship case, the Commission issued an order requiring the carriers in Alaska to file their tariffs not later than August 1, 1912. Because of the remoteness of the Territory of Alaska and the length of time necessarily consumed in the transmission of tariffs from points in Alaska to Washington for filing, the Commission, by special order of August 26, 1912, granted to carriers in Alaska permission to make changes effecting reductions in rates on freight traffic or in passenger fares to or from or between points in the Territory of Alaska on 10 days' notice. Full statutory notice of advances in rates or fares is required.

The situation with respect to telephone, telegraph, and cable companies, as outlined in our last annual report, as to the application of section 6 of the act and of the Elkins Act is unchanged.

DIVISION OF INQUIRY.

For the year beginning December 1, 1911, 93 indictments were returned for offenses against the act to regulate commerce. Several of these were against two or more defendants jointly. Of these 93 indictments 34 were against carriers or carriers' agents, 54 against shippers or passengers, and 5 against carriers and shippers jointly. Of the indictments against shippers 25 were for the offense of misbilling. Of the total number of indictments returned during the year 28 were for fraudulent transactions in connection with the operation of transit privileges.

During the same year 61 prosecutions were concluded. In 47 cases the defendants entered pleas of guilty. In 6 cases verdicts of guilty were rendered by juries. In 1 case a verdict of not guilty was returned by a jury. Seven cases were dismissed. In nearly every instance dismissal was caused by the fact that alternative indictments had been returned for the same offense.

The total amount assessed as penalties in the cases concluded by pleas of guilty and by verdicts of guilty was $344,420. Of this amount $207,000 was assessed against carriers or carriers' agents and $137,420 against shippers or passengers. The penalties in particular cases ranged from a minimum of $10 to a maximum of $55,000.

The more important points of law determined by the court decisions of the year are as follows:

In United States *v.* Harvie C. Miller et al. (223 U. S., 599), the Supreme Court held that proof of posting of rates need not be made in prosecutions against shippers charged with accepting rebates. The defendant in this case contended that no rate becomes legal as to a shipper until it has been posted in accordance with section 6 of the act to regulate commerce. The indictment alleged that the rate in

question had been established by the carrier, filed with the Commission, made public, and that the shipper, with knowledge of these facts, had accepted a lower rate. The indictment was silent on the subject of posting. In the lower court, on demurrer, this was held to be fatal. The Supreme Court held, however, that posting is an incident occurring after the establishment of the rate, and that shippers having knowledge of established rates may be held for acceptance of rebates, even though such rates have never been actually posted.

In United States *v.* Merchants & Miners Transportation Co. (187 Fed., 363), the circuit court of appeals for the fifth circuit held that a carrier on trial for rebating can not be allowed to make the defense that it was in error regarding its established rates. At the trial the carrier offered to prove that its agents were honestly mistaken in assessing less than the established rate. This proof was rejected by the trial court, which held that carriers are conclusively bound to a knowledge of the rates established by them. The circuit court of appeals sustained this ruling and affirmed the judgment. Application for a writ of certiorari was afterwards made to the Supreme Court, and by that court denied. The above case of United States *v.* Merchants & Miners Transportation Co. is also finally conclusive of the fact that in case of transportation partly by water and partly by rail the jurisdiction for departure from the established rates may be exercised by the district court of any district through which the transportation passes. This doctrine was established for all-rail carriers in United States *v.* Armour Packing Co. (209 U. S., 56). In The Merchants & Miners case, supra, it was urged by counsel that the incident of water carriage distinguished the case. The courts, however, adhered to the doctrine of the Armour Packing case.

A number of sentences of imprisonment for violation of the act to regulate commerce have been imposed during the present year. The first of these penalties was imposed in the southern district of New York in October, upon Mr. Harold R. Wakem, theretofore indicted for receiving rebates. Mr. Wakem entered a plea of guilty and the court imposed a penalty of $1,500 and a fine of one day's imprisonment. Subsequently in the same district the following penalties were imposed for like offenses: Jules E. Bernard, fine of $2,000 and one day's imprisonment; Maurice Ascher, fine of $1,000 and one day's imprisonment; August Bontoux, fine of $1,000 and one day's imprisonment; and Oscar F. Kosche, fine of $3,000 and one day's imprisonment.

In each of the cases last above mentioned the offenses consisted of the collection of rebates under the guise of commissions for the solicitation of traffic. In each case the defendant had ostensibly acted as import freight agent for a rail carrier, soliciting traffic for that carrier and receiving money payments for such services. While not the owner of the goods transported, these so-called import freight agents

were in fact the agents of the owners of such goods and themselves controlled the routing. The indictments were framed in harmony with previous rulings of the courts to the effect that in such cases the payment of the so-called commissions is really the purchase of the routing from the person controlling the same and is not to be distinguished from any other case of rebating. The courts decline to recognize an agent of the shipper as at the same time and in the same transactions the agent of the carrier.

W. L. Devine, import freight agent of the Chesapeake & Ohio Railway Co., was also indicted for payment of the commissions received by Mr. Wakem. He also pleaded guilty, the court imposing a fine of $15,000. A number of other indictments against shippers and carriers for rebating of the same nature are now pending.

Two indictments for violation of the commodities clause have been returned during the year, the Delaware, Lackawanna & Western Railroad Co. and the Delaware & Hudson Co. being the defendants. In the case of the Delaware, Lackawanna & Western a trial by jury has been had and a verdict of guilty rendered. A penalty of $2,000 was imposed by the court and appeal has been taken. In this case the Delaware, Lackawanna & Western Railroad owns and operates certain coal mines in the State of Pennsylvania. To avoid the operation of the commodities clause it sells its coal to a corporation owned by it before any real transportation is rendered. It was discovered, however, that this carrier had transported from Buffalo, N. Y., to its mine certain carload shipments of hay belonging to it and intended for use in the operation of its mine. The indictment and verdict above mentioned were based upon this state of facts.

The Chicago, Kalamazoo & Saginaw Railway Co. pleaded guilty to an indictment charging it with falsification of records, a penalty of $1,000 being assessed. In this case the carrier, in order to increase the divisions received by it from connecting carriers for the transportation of certain commodities moving on joint rates, falsely stated the point of origin of such shipments. The plea and judgment will strengthen the control of the Commission over the accounting systems of the various carriers.

During the present year also Mr. J. White Sprong, purchasing agent of the Delaware & Hudson Co., was indicted for falsification of records in connection with the transportation of certain commodities by the Delaware & Hudson Co. In this case the false entries appear to have been made for the purpose of increasing the divisions of the Delaware & Hudson Co. at the expense of connecting carriers, this result being reached by means of a false statement of the point of origin of the shipment.

The New Orleans & Northeastern Railroad Co. pleaded guilty to an indictment charging it with securing transportation of shipments of

coal intended for its use by misrepresentation of the destination of such shipments. These shipments were so billed as to appear to be destined to a distant point on the defendant's line, thus securing for it transportation to the junction point with its line at a rate less than the local rate to such junction point. As a matter of fact the shipments were destined to the junction point.

The St. Louis & San Francisco Railroad Co. has been indicted at St. Louis, Mo., for collecting more than its published rate upon certain shipments transported by it. This is the second indictment ever returned for this offense. In this case the railroad company assessed a rate higher than the rate filed with the Commission. More than two years thereafter this fact was discovered and the shipper made claim upon the railroad company for refund of the amount wrongfully collected. This claim was denied. The indictment resulted.

Various carriers in the New York Central system and various theatrical managers of Cincinnati, Ohio, were indicted during the year for engaging in a scheme to violate the law as to passenger fares. The device used included the payment of excessive amounts for railroad advertisements carried in theatrical programs, in consideration of which the theatrical companies were routed via the New York Central lines. The carriers entered pleas of guilty to these indictments, and substantial fines were imposed.

The most important prosecutions of the year may be said to be those which are based upon frauds perpetrated in connection with various transit privileges. Twenty-eight of these indictments have been returned, 15 being against shippers and 13 being against carriers. In every case they are based upon substitution of commodities at transit points by which published rates were violated. These abuses of transit have been repeatedly investigated by the Commission and discussed in its reports.

In these transit indictments the Government has taken the view that carriers publishing transit privileges are bound to inform themselves that the commodities accepted as the continuation of transit shipments are such in fact. This view was upheld by the District Court for the Western District of Michigan in the case of United States *v.* Grand Rapids & Indiana Railway Co., in which a jury trial was had and a verdict of guilty was returned.

The frauds incidental to the transit privilege are widespread, and further prosecutions of both carriers and shippers will probably be necessary before the violations of the act in this regard are discontinued.

For the first time in the history of the act indictments have been returned for the offense of giving and receiving free passenger transportation for journeys within the limits of a single State in consideration of the routing of interstate freight tonnage. These indictments

were returned in the district of Colorado in November last, the defendant carriers being the Denver & Rio Grande Railway Co. and the Colorado & Southern Railway Co. and the defendant shippers being the Colorado Fuel & Iron Co., the Victor American Fuel Co., the Colorado Portland Cement Co., the United States Portland Cement Co., and the Great Western Sugar Co. The investigations of this Commission indicated that the above carriers had pursued a systematic policy of distributing State passes to interstate freight shippers in consideration of such freight business. In connection with these indictments the Denver & Rio Grande Railway Co. was also indicted for issuing free transportation from a point in Colorado to another point in Colorado via its line, which is in part located in the State of New Mexico.

The prosecutions against the Hocking Valley Railway Co. and the Sunday Creek Coal Co., based upon the acceptance by the railroad company of promissory notes of the Sunday Creek Co. for freight charges amounting to $2,400,000, have been concluded in the lower court during the year. In these cases the court overruled the demurrers of the defendants to the indictments. Pleas of nolo contendere were thereupon entered. A penalty of $42,000 was entered against the Hocking Valley Railway Co. and a penalty of $20,000 imposed against the Sunday Creek Coal Co. These prosecutions are in accordance with the well-established law that carriers subject to the act to regulate commerce must collect published charges in money, all arrangements for compensation in credits or any property other than money being criminal.

During the year the various indictments against the ore-carrying roads owning docks at the various Lake Erie ports, and also against the companies formed to lease and operate such docks, have been concluded, pleas of nolo contendere being entered and total fines of $123,000 being imposed. In these cases it may be said to be finally established that carriers leasing terminal facilities to certain shippers, and thus creating discriminations as against other shippers not enjoying such leases, become criminally liable, and also that the shippers enjoying such discriminations are criminaly liable.

THE FOURTH SECTION.

As stated in our last annual report, 5,030 applications for permission to continue existing deviations from the general requirements of the amended fourth section of the act were filed with the Commission within the period prescribed in said section, to wit, on or before February 17, 1911. Since that date hundreds of other applications for permission to depart from the long-and-short-haul provision have been presented.

Many of the original applications were very comprehensive in their nature, covering practically all traffic and all points in the carrying trade of which the applicants participated. In a number of instances parts of such applications have been disposed of in connection with other proceedings involving the same rates or territory.

In a considerable number of cases carriers have eliminated the deviations covered by applications, and such applications have been disposed of by entering orders of denial.

The Commission has entered many temporary permissive orders, effective only until the questions involved in an application filed on or before February 17, 1911, have been determined, for the reason that there is more or less relationship between the rates covered by the temporary permissive order and those covered by the application referred to; and also many orders denying applications for permission to establish new deviations or to increase discriminations which existed at the time of the passage of the amended act and are covered by applications filed with the Commission.

Much testimony has been taken on numerous applications, which will be available when the cases come on for final disposition.

The various phases of this section of the act, as last amended, and the interpretation and application, as well as the constitutionality thereof, were referred to in our last annual report to the Congress and were discussed at length before the Supreme Court last spring in the argument of the so-called Intermountain cases, which had been appealed from the Commerce Court, the latter having decided adversely to the validity of the orders of the Commission therein. After submission these cases were again assigned for argument and were recently reargued before the full court, the vacancy on the Supreme Bench having been filled since the first argument. It is expected that when they are decided the Commission will be aided by the decision in disposing of many other cases arising under this section.

SUSPENSION OF PROPOSED CHANGES IN TARIFF SCHEDULES.

In the exercise of its authority to suspend the operation of new tariff schedules the Commission has not understood that it was the purpose of the provision of section 15 of the act of 1910 that, as a matter of course, all advances in rates should be suspended; but upon the contrary has proceeded upon the idea that it was the purpose of this provision that it should exercise sound discretion in these matters. Therefore, upon such preliminary consideration as it has been practicable to give, the Commission has undertaken to distinguish between current changes in rates which might be regarded as natural and normal readjustments occurring in the ordinary course

of business, and distinct and material advances for the definite purpose of increasing rates; and in the latter class of cases it has undertaken to scrutinize the apparent reasons therefor and has acted in the light of another provision of amended section 15, which casts upon the carriers the burden of justifying rates advanced after January 1, 1910.

In the ordinary course of business there are made during the year many thousands of changes in rates, involving slight reductions and advances, to which no objection is made on the part of the shipping public, and which do not seem to warrant suspension and investigation by the Commission, and are therefore permitted to become effective. Generally speaking, important advances in rates are made the subject of protest by shippers. When such protests are received by the Commission the tariffs in question are at once examined to determine the amount and extent of the proposed changes, and notice of the protest is sent to the interested carriers by letter, if there is time to conduct the correspondence in that way; if not, the carriers are notified by wire of the protest and requested to state their reasons for the proposed change. After an examination of the tariffs and consideration of the matters stated in the protests from the shippers, as well as of the reasons given by the carriers, the Commission determines whether there is probable cause for suspending the operation of the tariff pending an investigation into the propriety of the proposed advances, or whether it is proper to permit the same to become effective on the date fixed by the carrier, subject to later complaint by the shipper in the usual manner.

For the purpose of securing the fullest possible information to guide the Commission in the exercise of a sound discretion in dealing with protests against proposed increases or changes in tariff schedules it has given publicity to a rule to the effect that ordinarily it will not suspend the operation of a new schedule in consequence of protests where same are not presented, when practicable, at least 10 days prior to the effective date of such schedule. This rule, however, is not for the purpose of indicating that the Commission may not upon its own initiative suspend the operation of new tariff schedules, even without the receipt of protests, when in its judgment the ends of justice seem to require it; nor has the Commission strictly enforced or observed this rule in cases where it seemed certain that the proposed changes should be suspended pending investigation.

Since December 1, 1911, the Commission has suspended tariffs in 120 cases and has declined to exercise this authority with respect to proposed changes in 112 cases where protests were made by shippers.

Since June 18, 1910, when the Commission was authorized by the act approved on that date to suspend new tariff schedules pending investigation, that authority has been exercised in 189 cases. A list

of these, showing the disposition made of each case, will be found in the Appendix to this report.

By reference to this list it will be observed that out of the investigations which have been completed up to this time the advances proposed by the carriers were condemned in 32 cases; the advances were allowed in whole in 30 cases and allowed in part in 15 cases; and in 22 cases the proposed advances were withdrawn by the carriers after suspension, and no further action by the Commission was necessary.

Following the recommendations of the Commission to the effect that the carriers throughout the United States should establish a uniform classification of freight, a committee representing the carriers has spent several years seeking to standardize the three principal classifications of the country with respect to description of articles transported, minimum carload weights, and certain other matters. This committee, however, has not attempted to fix ratings which shall be uniform throughout the country.

Under the present practice, when the so-called uniform committee has completed its work upon a certain subject, its recommendations thereon are submitted to the three classification committees and ordinarily adopted by those committees. A considerable number of recommendations made by the uniform committee were published in Official Classification 38, which was filed January 15, 1912, to become effective March 1, 1912. Substantially no objections were made to the new classification on the part of the shippers and it was not suspended by the Commission. On the other hand, similar matter published by the western classification committee in a classification filed December 28, 1911, to become effective February 15, 1912, led to numerous protests, and substantially all of the State railroad commissions in the territory affected requested that the classification be suspended pending investigation of the new items. It was urged that, in addition to providing uniform descriptions and minimum weights, the new classification advanced the ratings on many articles. Therefore, although it was not the intention of the Commission to discourage or retard the establishment of uniform classification, but on the contrary to promote the same, there appeared to be good reason for temporary suspension of these proposed schedules for the purpose of examining into their probable results, and the classification was accordingly suspended. Hearings have been held at important points throughout the United States, the case has been argued, and it is expected that the Commission will be able to announce its conclusions within a short time.

In like manner the southern classification committee filed on May 6, to become effective June 17, 1912, a classification which embodies the recommendations of the uniform classification committee. Pro-

tests against the new classification were made by several of the State railroad commissions of Southern States and by numerous commercial bodies. Upon being notified that such protests had been made, the classification committee requested that, instead of a suspension and formal investigation by the Commission, the committee itself be permitted to postpone the effective date of the classification pending conferences with shippers and State railroad commissions, with a view to eliminating the items against which apparently meritorious objections had been made. A number of conferences were held between representatives of the carriers, of State railroad commissions, and of shippers' organizations, in which this Commission participated, and as a result of such conferences the protestants finally submitted a list of the particular items in the new classification which they desired to have suspended pending investigation. Thereupon the carriers stated that if the Commission should be of opinion that certain items should be suspended for the time being, the carriers would withdraw such items, put them on their public docket and give them further consideration, thus permitting all parts of the new classification to which no serious objection existed to become effective November 1, 1912. Subsequently the Commission advised the carriers of the items which it believed should be withdrawn pending further investigation. These recommendations were accepted by the carriers and published in a supplement to the classification which became effective November 1, on the same date as the classification itself.

CASES DECIDED BY THE SUPREME COURT.

Since our last annual report to the Congress 14 cases involving the validity of the orders of the Commission have been decided by the Supreme Court of the United States. All of these cases are of general public interest and will be briefly referred to.

LUMBER CASES.

Interstate Commerce Commission v. *Union Pacific Railroad Co. et al.*, *Interstate Commerce Commission* v. *Northern Pacific Railway Co. et al.*, and *Interstate Commerce Commission* v. *Great Northern Railway Co. et al.* (222 U. S., 541).

These cases involve orders of the Commission establishing rates on lumber from points of production along the Pacific coast in the Northwest to eastern destinations. In 1907 carriers had advanced these rates, and that advance had been attacked by producers and shippers of lumber. The Commission found the advances in part unreasonable and ordered the carriers to establish rates found by it to be reasonable. These orders were complied with, but the transcontinental lines at the same time filed in the circuit court petitions to set aside these orders. The circuit court referred the cases to a master

to determine the facts, and a very elaborate trial took place, as a result of which the master filed a report in part condemning and in part sustaining the orders of the Commission.

The Commission in its opinion had drawn a line north and south through Pembina, N. Dak., known as the Pembina-Port Arthur line. It had condemned all advances to the west of this line, but to the east had permitted the advances in part and in part condemned them. The report of the master sustained the order of the Commission as to all points to the west of the Pembina line, but condemned the report and orders in so far as they had failed to permit the entire advances to the east of that line. For example, the old rate from the Pacific coast to St. Paul had been 40 cents per 100 pounds; the advanced rate was 50 cents per 100 pounds; the Commission established a rate of 45 cents per 100 pounds. The master found that the order of the Commission, in so far as it refused to permit the advanced rate of 50 cents, was unlawful and recommended that it be enjoined.

This report was accepted by the circuit court and a decree entered enjoining the orders of the Commission in accordance with the recommendation of the report. In order that the precise ground upon which the court proceeded may be understood, the exact language used by the circuit court in deciding the case is given in full below:

> All the exceptions to the report of the master must be overruled. Those which challenge his finding that the reduction, by the Interstate Commerce Commission, of the 50-cent rate on lumber to St. Paul and other points east of the Pembina line was arbitrary, and so palpably unjust and unreasonable, and so discriminatory that it was beyond the power of the Commission, are overruled, on the ground that this action of the Commission was beyond its power, or so palpably and gravely unjust and unreasonable as to be beyond the substance, if not beyond the form, of its power.

This decree of the circuit court was reversed by the Supreme Court of the United States, which used, in stating the jurisdiction of the court to review an order of the Commission, the following language:

> There has been no attempt to make an exhaustive statement of the principle involved, but in cases thus far decided it has been settled that the orders of the Commission are final unless (1) beyond the power which it could constitutionally exercise; or (2) beyond its statutory power; or (3) based upon a mistake of law. But questions of fact may be involved in the determination of questions of law, so that an order, regular on its face, may be set aside if it appears that (4) the rate is so low as to be confiscatory and in violation of the constitutional prohibition against taking property without due process of law; or (5) if the Commission acted so arbitrarily and unjustly as to fix rates contrary to evidence, or without evidence to support it; or (6) if the authority therein involved has been exercised in such an unreasonable manner as to cause it to be within the elementary rule that the substance, and not the shadow, determines the validity of the exercise of the power. * * *
>
> In determining these mixed questions of law and fact, the court confines itself to the ultimate question as to whether the Commission acted within its power. It will not consider the expediency or wisdom of the order, or whether, on

like testimony, it would have made a similar ruling. "The findings of the Commission are made by law prima facie true, and this court has ascribed to them the strength due to the judgments of a tribunal appointed by law and informed by experience." (Ill. Cent. *v.* I. C. C., 206 U. S., 441.) Its conclusion, of course, is subject to review, but when supported by evidence is accepted as final; not that its decision, involving as it does so many and such vast public interests, can be supported by a mere scintilla of proof, but the courts will not examine the facts further than to determine whether there was substantial evidence to sustain the order. (Id., 547–548.)

It will be seen that the circuit court based its action upon the ground that the order of the Commission was arbitrary and so unjust as to be palpably beyond its power. This, apparently, is one of the grounds upon which an order of the Commission may be enjoined by the court. But the Supreme Court found in this case, upon an examination of the record, that there was evidence which fairly sustained the order of the Commission. Commenting upon this evidence the court said:

With that sort of evidence before them, rate experts of acknowledged ability and fairness, and each acting independently of the other, may not have reached identically the same conclusion. We do not know whether the results would have been approximately the same, for there is no possibility of solving the question as though it were a mathematical problem to which there could only be one correct answer. Still, there was in this mass of facts that out of which experts could have named a rate. The law makes the Commission's finding on such facts conclusive. There was, then, under the statute, nothing for the companies to do except to comply with the order or act on the suggestion thrown out in the Commission's answer, and apply for a rehearing, in reliance upon its power and duty to modify its order if the new evidence warranted such change. (Id., 550.)

The important conclusion from this case is that inferior courts in reviewing the orders of the Commission must observe not only the letter but also the spirit and the substance of the rule under which they obtain jurisdiction.

NEGATIVE ORDERS NOT REVIEWABLE.

Procter & Gamble Co. v. *United States et al.* (225 U. S., 282).

The demurrage rules of the carriers provided that demurrage should accrue upon a car owned by private individuals until unloaded, even though the car might be standing upon the tracks of its owner. Procter & Gamble, who were the owners of many tank cars, brought complaint before the Commission alleging that this rule was unjust and unlawful in that it imposed demurrage upon a private car after it had been returned to the possession of its owners. The Commission sustained the rule, holding that it was just and reasonable and necessary to prevent undue discrimination under the act to regulate commerce, and dismissed the complaint.

Thereupon Procter & Gamble filed a petition in the Commerce Court asking that the order of the Commission dismissing the complaint be set aside and that the demurrage rule be held unlawful and its operation enjoined. The Commerce Court assumed jurisdiction, but held upon consideration that the conclusion reached by the Commission had been correct and that therefore its order dismissing the complaint should be sustained. Upon this finding the petition of the Procter & Gamble Co. was dismissed by the Commerce Court, and from this decree an appeal was taken to the Supreme Court of the United States.

It will be seen that the jurisdictional question presented was whether the Commerce Court had authority to review a negative order of the Commission. Upon the part of the Government it was contended that no such authority existed, since to support the existence of such jurisdiction it must be held that the Commerce Court had power to review the administrative action of the Commission and substitute its judgment for the judgment of the Commission in matters of administrative action. The court stated the question for decision in the following language:

> The question to be decided is this: Does the authority with which the Commerce Court is clothed in virtue of these provisions invest that body with jurisdiction to redress complaints based exclusively upon the conception that the Interstate Commerce Commission, in a matter submitted to its judgment and within its competency to consider, has mistakenly refused, upon the ground that no right to the relief claimed was given by the act to regulate commerce, to award the relief which was claimed at its hands? In other words, the important question is: Is the authority of the Commerce Court confined to enforcing or restraining, as the case may require, affirmative orders of the Commission, or has it the power to exert its own judgment by originally interpreting the administrative features of the act to regulate commerce and upon that assumption treat a refusal of the Commission to grant relief as an affirmative order and accordingly pass on its correctness? (Id., 292.)

Since the Commerce Court was a creature of statute, the Supreme Court said that the act creating it must be looked to for a definition of its jurisdiction and that it could possess no authority beyond that conferred by this statute. It proceeded therefore to examine the act of June 18, 1910, which created the Commerce Court, for the purpose of ascertaining whether it possessed the affirmative jurisdiction claimed. Its conclusion was that upon the plain reading of that statute the jurisdiction of the court was confined to restraining the operation of the orders of the Commission and that it possessed no affirmative authority to enforce the administrative provisions of that act.

Having reached this conclusion upon an examination of the statute itself, it then proceeded to an exhaustive discussion of the scope and purposes of the act to regulate commerce and the part which the

courts play in the administration and operation of that act. This subject is of such general interest and the language of the court upon the matters involved so clear that, rather than assume the hazard of making a wrong deduction, we give below that portion of the opinion in extenso:

We might well be content to rest our conclusion upon the considerations just stated. In view, however, of the importance of the subject we do not do so, but shall consider the matter in a broader aspect for the purpose of demonstrating that to give to the statute a meaning contrary to that which we have found results from its text, and therefore to recognize the existence in the court below of the power which it deemed it possessed would result in frustrating the legislative public policy which led to the adoption of the act to regulate commerce, would render impossible a resort to the remedies which the statute was enacted to afford, would multiply the evils which the act to regulate commerce was adopted to prevent, and thus bring about disaster by creating confusion and conflict where clearness and unity of action was contemplated. It can not be disputed that the act creating the Commerce Court was intended to be but a part of the existing system for the regulation of interstate commerce, which was established by virtue of the original adoption in 1887 of the act to regulate commerce, and which was expanded by the repeated amendments of that act which followed, developed in practical execution by the rulings of the body (Interstate Commerce Commission) upon whom was cast the administrative enforcement of the act, the whole elucidated and sanctioned by a long line of decisions of this court. That in adopting the provisions concerning the Commerce Court and making it part of the system it was not intended to destroy the existing machinery or method of regulation, but to cause it to be more efficient by affording a more harmonious means for securing the judicial enforcement of the act to regulate commerce is certain. The act creating the Commerce Court (June 18, 1910; 36 Stat., 539, ch. 309) was entitled "An act to create a Commerce Court, and to amend the act entitled 'An act to regulate commerce,' approved February 4, 1887, as heretofore amended, and for other purposes." The first six sections, which called into being the Commerce Court and defined its powers, all demonstrate the purpose as above stated—that is, to adjust the powers and duties of the newly created court in such manner as to cause them to accord with the system of regulation provided by the act to regulate commerce as it then existed.

What was then the existing system and the functions which the new court was created to perform will be conclusively shown by a brief outline of the scope and purpose of the system which arose from the enactment of the act to regulate commerce (act Feb. 4, 1887, ch. 104; 24 Stat., 379) and its development. By that act as originally enacted many regulations and consequent duties were imposed upon carriers in the interest of the public and of shippers which did not theretofore exist, and various administrative safeguards were formulated, all of which, in their very essence, required, first, for their compulsory enforcement the exercise of official functions of an administrative nature, and, second, for their harmonious development an official unity of action which could only be brought about by a single administrative initiative and primary control. To that end the act (sec. 11) created an administrative body endowed with what may be in some respects qualified as quasi-judicial attributes, to whom was confided the enforcement of those provisions of the act which essentially exacted unity in order that they might beneficially operate. And for the purposes stated, to the body thus created was committed the trust of enforcing the act in the respect stated, of determining, limited as to the subject matters to which we

have referred, whether the provisions of the act had been violated, and if so, of primarily enforcing the act by awarding appropriate relief. The statute, therefore, necessarily, while it created new rights in favor of shippers, in order to make those rights fruitful as to the subjects with which the statute dealt coming within the scope of the administrative unity which we have mentioned primarily made the judgment of the administrative body to whom the statute confided the enforcement of the act in the respects stated a prerequisite to a a resort to the courts. In other words, as to the subjects stated the act did not give to the courts power to hear the complaint of a party concerning a violation of the act, but only conferred power to give effect to such complaints when, by previous submission to the Commission, they had been sanctioned by a command of that body.

In the long interval which intervened between 1887, when the act to regulate commerce was enacted, and June 18, 1910, when the Commerce Court act was passed, we have learned of no instance where it was held, or even seriously asserted, that as to subjects which in their nature were administrative and within the competency of the Commission to decide, there was power in a court, by an exercise of original action, to enforce its conceptions as to the meaning of the act to regulate commerce by dealing directly with the subject irrespective of any prior affirmative command or action by the Interstate Commerce Commission. On the contrary, by a long line of decisions, whereby applications to enforce orders of the Commission were considered and disposed of, or where requests to restrain the enforcement of such orders were passed upon, it appears by the reasoning indulged in that it was never considered that there was power in the courts as an original question, without previous affirmative action by the Commission, to deal with what might be termed in a broad sense the administrative features of the act to regulate commerce by determining as an original question that there had been a compliance or noncompliance with the provisions of the act. The subject is illustrated and made clear by the rulings in State of Washington ex rel. Oregon Railroad & Navigation Co. *v.* Fairchild (224 U. S., 510), Robinson *v.* Baltimore & Ohio R. R. (222 U. S., 506), Southern Railway Co. *v.* Reid (222 U. S., 424), and Texas & Pacific Ry. *v.* Abilene Cotton Oil Co. (204 U. S., 426). The latter case especially will serve to point out that where the power of original action by a court without previous action of the Commission was insisted upon, it was based upon the conception that the particular subject matter as to which such power was asserted was by the express terms of the act to regulate commerce not embraced within the subjects primarily confided by the act exclusively to the administrative authority of the Commission.

Originally the duty of the courts to determine whether an order of the Commission should or not be enforced carried with it the obligation to consider both the facts and the law. But it had come to pass prior to the passage of the act creating the Commerce Court that in considering the subject of orders of the Commission, for the purpose of enforcing or restraining their enforcement, the courts were confined by statutory operation to determining whether there had been violations of the Constitution, a want of conformity to statutory authority, or of ascertaining whether power had been so arbitrarily exercised as virtually to transcend the authority conferred, although it may be not technically doing so. (Int. Com. Comm. *v.* Union Pacific R. R., 222 U. S., 541, 547; Int. Com. Comm. *v.* Ill. Cent. R. R., 215 U. S., 452.) So also at the time the law creating the Commerce Court was passed suits to compel obedience to orders of the Commission or to restrain an enforcement of such orders were required to be brought in the circuit court of the United States in the district where a carrier

or one of two or more carriers to whom the order was directed had its principal operating office.

In view of the provisions of the act to regulate commerce just referred to as originally enacted, of the legislative evolution of that act, its uniform practical enforcement, and the constant judicial interpretation which we have thus briefly indicated, it is impossible, we think, in reason to give to the act creating the Commerce Court the meaning affixed to it by the court below, since to do so would be virtually to overthrow the entire system which had arisen from the adoption and enforcement of the act to regulate commerce. First, because as the previous ascertainment by the Commission on complaint made to it as to whether violations of the act had been committed, with reference to the subjects as to which previous action was required, was an essential prerequisite to a right to complain in a court, the interpretation given below would, by destroying the necessity for the prerequisite action of the Commission, operate to create a vast body of rights which had no existence at the time the Commerce Court act was passed. Second, because the recognition of a right in a court to assert the power now claimed would of necessity amount to a substitution of the court for the Commission, or at all events would be to create a divided authority on a matter where from the beginning primary singleness of action and unity was deemed to be imperative. Third, because the result of the interpretation would be to bring about the contradiction and the confusion which it had been the inflexible purpose of the lawmaker from the beginning to guard against, an interpretation which would seemingly create rights hitherto nonexistent and yet at once proceed to destroy such rights by bringing about a confusion which would render the rights which the act creates practically valueless. Indeed, these inevitable results of the interpretation given by the court below to the act would necessarily amount to declaring that Congress in seeking to unify and perfect the administrative machinery of the act to regulate commerce and to make more beneficial its operation had overthrown the whole fabric of the system as previously existing. (Id., 294–299.)

The central thought to be gathered from this exposition of the law seems to be that the administrative judgment of the Commission, as expressed by its orders, can not be reviewed by the courts, in so far as they are within its delegated authority, not confiscatory, and not palpably arbitrary and unreasonable.

CONSTITUTIONAL RIGHT TO REASONABLE RATE.

Hooker et al. v. *Knapp et al.; Eagle White Lead Co. et al.* v. *Interstate Commerce Commission et al.*, 225 U. S., 302.

Certain individuals residing and doing business in the city of Cincinnati filed complaint with the Commission alleging that rates from Cincinnati to Chattanooga, Tenn., were unreasonable and unduly discriminatory. The Commission, after hearing, held that the rates were unreasonable and prescribed a lower schedule than that in effect, which the carriers proceeded to establish. The complainants insisted that the rates so established were still unreasonably high and filed a petition in the circuit court asking that the order of the Commission establishing these rates and refusing inferentially to establish lower rates be set aside.

The case was transferred from the circuit court to the Commerce Court under the act creating that court. The Commerce Court took jurisdiction, but held that the conclusion reached by the Commission was correct and ought not to be disturbed. It therefore decreed a dismissal of the petition, and from this decree an appeal was taken to the Supreme Court.

The Supreme Court disposed of these cases by stating that they were in all respects controlled by the Procter & Gamble case, above referred to, and should be dismissed for want of jurisdiction.

One of the claims of the petitioners before the Commerce Court, and again before the Supreme Court, was that they, as shippers, possessed a constitutional right to a reasonable rate, and that this right had been denied them by the order of the Commission. In the Procter & Gamble case the point had been made that the constitutional rights of the petitioners in that case were violated. Answering that claim the Supreme Court had said:

> If the claim of constitutional rights concerned a subject which, from its very nature and effect, dominated the act to regulate commerce, and therefore was wholly independent of all questions of right or remedy created by or depending upon that statute, then the issue presented a controversy not cognizable in the Commerce Court, as it could not so be without violating the express reservation and restriction as to the general power of the circuit courts, which we have just quoted. If, on the other hand, the constitutional question was involved in or depended upon the provisions of the act to regulate commerce, that question in the nature of things was subject to the precedent action of the Commission on the subjects committed to it by the act to regulate commerce and as to which the court had jurisdiction alone to act in virtue of a prior affirmative order of the Commission. (Id., 301.)

These suits had been brought originally in the circuit court and transferred to the Commerce Court. If they involved a constitutional right which the circuit court might have enforced, but which the Commerce Court had no power to enforce for want of jurisdiction—in other words, if the petitioners possessed a dominant constitutional right—then it might follow that that right should have been prosecuted before the circuit court, and that the case ought not to have been transferred to the Commerce Court.

A petition for rehearing was filed by the appellants, presenting this question to the court, and that petition was denied.

PRELIMINARY INJUNCTIONS.

United States et al. v. *Baltimore & Ohio Railroad Co. et al.* (225 U. S., 306).

The Commission had entered an order against the Baltimore & Ohio Co. and other carriers, directing them to cease and desist from certain practices in reference to the transportation of sugar in New York Harbor, which it found to be unduly discriminatory and,

therefore, unlawful. These railroad companies filed a petition in the Commerce Court asking for both a preliminary and a permanent injunction against the enforcement of this order.

The United States and the intervenors in that proceeding filed motions to dismiss and the case was argued upon these motions. The court entered no final decree but did grant a preliminary injunction restraining the order of the Commission until further action by the court. From this decree granting a preliminary injunction an appeal was taken by the Government and the intervenors, and the only question presented to the Supreme Court was the lawfulness of the action of the Commerce Court in issuing the preliminary injunction.

The United States and the intervenors claimed that under the act creating the Commerce Court no preliminary injunction could be issued by that court without a finding that irreparable injury would result if the injunction did not issue, and without a statement upon the part of the court of the facts and reasons upon which it acted in the issuing of the injunction. In denying this contention and dismissing the appeal the Supreme Court defined the instances in which restraining orders or injunctions might be issued by the Commerce Court, as follows:

> Without ambiguity we think the statute contemplates three classes of orders: First, a temporary restraining order staying in whole or in part the operation of the order of the Interstate Commerce Commission for not more than 60 days from the date of the suspensive order, to be allowed by the court or a judge thereof; second, a preliminary injunction—that is, an injunction pendente lite—which, to quote the words of the statute, may be granted by the court to "Restrain or suspend, in whole or in part, the operation of the Commission's order pending the final hearing and determination of the suit"; third, in the nature of things a perpetual injunction upon the entry of the final decree. The order in this case, made after notice and hearing, suspending the force and effect of the order of the Commission until the further order of the court, was obviously an exercise of the power conferred to grant a preliminary injunction or injunction pendente lite, and not of the power to allow a temporary restraining order embraced in the first of the classes stated. As we think it clear that the requirements of the statute relied upon respecting the statement of facts as to irreparable damages relate only to the first class of cases—that is, the power to issue a temporary restraining order—we hold the objection to be without merit. (Id., 322.)

The court then proceeded to say that where the discretion of the court in the issuing of the temporary injunction had not been abused the exercise of that discretion would not be interfered with by the Supreme Court upon appeal, and further, that in the case before it there had been no such abuse of authority. In concluding its opinion the court said:

> Of course, in saying this, we must not be understood as deciding or in any way implying that the duty would not exist to examine the merits of a preliminary order of the general character of the one before us in a case where

it plainly in our judgment appeared that the granting of the preliminary order was in effect a decision by the court of the whole controversy on the merits or where it was demonstrable that grave detriment to the public interest would result from not considering and finally disposing of the controversy without remanding to enable the court below to do so. (Id., 326.)

RESTRICTED RATES.

United States et al. v. *Baltimore & Ohio Railroad Co. et al.* (225 U. S., 326).

Large quantities of coal are consumed by railroads as locomotive fuel, and to some extent for other purposes, and this coal is often and perhaps usually produced upon lines of railway other than those of the consuming company. It has been in the past, in certain sections of the country, the practice to make rates on this railroad fuel coal which differed from rates contemporaneously applied to the transportation of commercial coal. Such rates were filed and published by carriers as required under the sixth section.

The Commission had held that the rate of transportation could not properly be made to depend upon the use to which the article was put; that is, that the rate must be the same for the same service to all persons and for all purposes. After fully investigating in a formal proceeding instituted for that purpose the practice of carriers in applying special rates to the carriage of railroad fuel coal, the conclusion was reached that this resulted in undue discrimination and was therefore unlawful. An order was issued requiring the defendant carriers to cease and desist from that practice for the future.

The railroads affected petitioned the Commerce Court for both a preliminary and a permanent injunction against this order. The United States and the Commission filed motions to dismiss, and the case was heard by the Commerce Court upon such motions. That court, without the delivery of any opinion, granted a preliminary injunction, from which both the United States and the intervenor appealed.

The case was fully argued upon its merits before the Supreme Court. It was insisted by the carriers that railroad coal did not compete with commercial coal; that the incidents of carriage were different in case of railroad than of commercial coal; and that for this and other reasons the order of the Commission requiring an abandonment of this system of charges ought not to be sustained.

The Supreme Court sustained the appeal and remanded the cause to the Commerce Court with instructions to dismiss the petition. Apparently the court held that whether this was or was not an undue discrimination was a question of fact as to which the conclusion of the Commission ought not to be disturbed.

The important point to be noted is that the court has thereby sustained the holding of the Commission that the rate of transportation can not be varied according to the use to which an article is put.

This case was before the Supreme Court upon an appeal from the decree of the Commerce Court granting a preliminary injunction in exactly the same way as was the Federal Sugar Refining Co. case just previously referred to. No reference is made in either one of these opinions to the other, and the court nowhere intimates why it denied the appeal in one case and sustained it in the other. Both cases were argued upon their merits in the Supreme Court. It would rather appear that the court in this latter case was satisfied that upon the pleadings there was clearly no ground upon which the courts could interfere, while the former case presented a fairly doubtful question which might properly be further considered.

MANDAMUS TO TAKE JURISDICTION.

Interstate Commerce Commission v. *United States ex rel. Humboldt Steamship Co.* (224 U. S., 474).

The Humboldt Steamship Co. filed complaint with the Commission attacking certain rates and transportation practices in Alaska, and this complaint was dismissed by the Commission solely upon the ground that it had no jurisdiction over railways in Alaska under the act to regulate commerce.

After having filed a petition for rehearing with the Commission, which was denied, the steamship company brought a petition for mandamus in the Supreme Court of the District of Columbia, and that finally reached the Supreme Court of the United States upon appeal.

That court held:

1. That Alaska was a territory within the meaning of section 1 of the act to regulate commerce, as amended June 29, 1906.

2. That the authority which had up to that time been exercised by the Secretary of the Interior over railway rates in Alaska was thereby superseded and withdrawn.

3. That the decision of the Commission defining its jurisdiction is reviewable by the courts.

4. That the Commerce Court has no jurisdiction over an order of the Commission dismissing a complaint for want of jurisdiction.

5. That the Supreme Court of the District of Columbia may, by mandamus, require the Commission to proceed with a complaint which it has dismissed solely for want of jurisdiction, provided such jurisdiction exists, for while the court can not control the discretion of an administrative body it may direct it to exercise its jurisdiction.

ACCOUNTS OF WATER CARRIERS.

Interstate Commerce Commission v. *Goodrich Transportation Co.* (2 cases); *Interstate Commerce Commission* v. *White Star Line* (2 cases) (224 U. S., 194).

The act to regulate commerce makes water carriers subject to the jurisdiction of the Commission in so far as they engage in interstate transportation by rail and water under a common control, management, or arrangement for continuous carriage or shipment. The Commission holds that under this provision it has no jurisdiction of the business of a water carrier which is not embraced in the above definition.

The twentieth section of the act authorizes the Commission to require from carriers subject to its jurisdiction financial reports showing certain facts with respect to their business operations, and the Commission has, in pursuance of this authority, directed water carriers subject to its jurisdiction as above to make reports giving specified information. The information called for extends to the entire business of water carriers, both that which is and that which is not under the act.

The appellees in the above cases upon being served with this order filed petitions with the Commerce Court asking that the Commission be restrained from enforcing these orders, upon the ground that no financial report could be required touching that portion of their business which was not subject to the act. The Commerce Court by its decree sustained this claim and from that decree this appeal was taken.

The Supreme Court reversed the decree and remanded the cases to the Commerce Court with instructions to dismiss the petitions. It put its decision upon the ground that the act clearly gave the Commission authority to require all the information called for by the orders; that such authority was not violative of the constitutional rights of the appellees, and that the purpose in requiring the information could only be subserved by extending the order to cover the entire business of the water carrier.

One of the appellees maintains an amusement park, and it was urged that as to this certainly the Commission had no right to extend its order, but the court held otherwise. The concluding paragraph of the opinion was as follows:

> We think the uniform system of accounting prescribed and the report called for are such as it is within the power of the Commission to require under section 20 of the act. Nor do the requirements exceed the constitutional authority of Congress to pass such a law. It therefore follows that the Commerce Court erred in granting the injunctions and in remanding the cases to the Commission with instructions to recast its orders. (Id., 216.)

PHYSICAL CONNECTION WITH BRANCH LINES.

United States et al. v. *Baltimore & Ohio Southwestern Railroad Co. et al.* (Decided Nov. 11, 1912.)

The Columbus Traction Co. operates a line of electric railway carrying both freight and passengers entirely within the State of Ohio, running from Norwood, near Cincinnati, to Hillsboro. The Baltimore & Ohio Southwestern Railroad Co. and the Norfolk & Western Railway Co. each operate main lines of railroad running from Cincinnati, of which Norwood is a suburb, to Hillsboro. The lines of both these steam roads and of the electric roads are in close proximity at Norwood. The lines of the steam railroad diverge as they run eastwardly, but again converge at Hillsboro, while the line of the electric railway bisects the area embraced between the two steam roads. Some stations upon the electric line are distant from 10 to 12 miles from stations upon either of the steam roads.

The Columbus Traction Co. filed a petition with this Commission asking that a physical connection be ordered between its track and those of the steam railroads, and that through routes and joint rates be established. The Commission granted the prayer for a physical connection, and ordered through routes and joint rates from those points on the electric line which were not accessible to either of the steam railroads, but not from those points which were fairly competitive with these main lines.

The Commerce Court enjoined the order of the Commission, and that decision is now sustained by the Supreme Court. The Commission is given jurisdiction to order, under certain circumstances, a connection between a main line railroad and a "lateral, branch line." The Supreme Court holds that the Columbus Traction Co. is not such a line. Its language upon this point is as follows:

> The words "lateral, branch line" do not refer to what the applicant may become or be made by order of the Commission but to what it already is when it applies. The power of the Commission does not extend to ordering a connection wherever it sees fit, but is limited to a certain and somewhat narrow class of lines. The most obvious examples of such lines are those that are dependent upon and incident to the main line—feeders, such as may be built from mines or forests to bring coal, ore or lumber to the main line for shipment. We agree with the Commerce Court that the traction company is not within this class. It is an independent venture, in its general course parallel to, more or less competing with, the steam roads and working on a different plan. Presumably and so far as appears it was built and would have been run without regard to the existence of the steam roads. The cases cited on behalf of the appellants as to the power of railroad companies to construct branch roads under their charter do not apply. There the determination of the company fixes the character of the branch; it builds the branch from the beginning as incident to the purposes of the company. But here, as we have said, this determination of the Commission that the applicants shall be a branch is not enough; the applicant must be a branch before it applies. That is the absolute

and reasonable condition. That some shippers would be accommodated by a switch connection is not enough.

The court said that the part of our order establishing through routes and joint rates must fall with that portion ordering a physical connection. If it should finally be determined that this Commission can not establish a through route except where a physical connection exists, and that no physical connection can be ordered except with lateral, branch lines as defined by the court, the effect will be to deprive many communities of access by through routes of transportation to the outer markets.

CASES IN THE COMMERCE COURT.

Since the date of our last report to Congress 29 suits have been filed in the Commerce Court to annul orders of the Commission.

During the year, applications to the Commerce Court for preliminary injunctions were made in 15 cases, but 3 of the cases were dismissed for want of jurisdiction. Preliminary injunctions were granted in 2 cases and denied in 4, and applications pertaining to the remaining 6 cases are now before the court for determination.

During the year, the Commerce Court has decided upon their merits 11 cases. In 4 the orders of the Commission were annulled, and in 7, including 3 which were afterwards dismissed for want of jurisdiction, the orders of the Commission were sustained.

In 11 cases, where negative orders of the Commission were involved, decrees of dismissal were entered by the Commerce Court following the decision of the Supreme Court in the Proctor & Gamble case.

Ten cases were dismissed on application of the petitioners and 8 were dismissed in compliance with mandates of the Supreme Court.

There are now pending before the Commerce Court 22 suits involving orders of the Commission, 10 of which are awaiting decision, but this includes the 6 which are before the court for determination upon motions for preliminary injunctions. The remaining 12 are not yet ready for hearing.

A brief statement of all the cases decided, together with the import of each decision, is given in the Appendix.

DIVISION OF STATISTICS.

The work of this division during the past year has been of the same general character as in preceding years.

The Preliminary Abstract of Statistics of Common Carriers, issued last year, was, to some extent, an experiment. Judging by the demand for it, it seems to have been found of interest, and the Commission has this year extended its scope with respect to carriers by railway, so that the forthcoming issue will include all reporting car-

riers having gross operating revenues in excess of $1,000,000 for the year, thus including about three times as many carriers as were included in the issue for 1911. The number of operating companies included in the preliminary abstract for 1912 is 173.

In the Commission's report for 1911 a statement was inserted giving operating revenues, expenses, etc., for the railway common carriers having operating revenues in excess of $10,000,000 for the year ended June 30. A similar compilation has been made from the reports for the year ended June 30, 1912, and is here inserted.

Summary statement of operating income account of steam railway carriers in the United States having operating revenues in excess of $10,000,000 for the year ended June 30, 1912.

	Grand total (63 carriers)		Eastern district (27 carriers).[1]		Southern district (10 carriers).[1]		Western district (26 carriers).[1]	
	1912	1911	1912	1911	1912	1911	1912	1911
Average number of miles of road operated	176,287.36	173,758.25	43,284.03	42,526.30	32,686.99	32,400.54	100,316.34	98,831.41
Operating income:								
Rail operations—								
Operating revenues	$2,361,235,761	$2,315,309,264	$1,055,447,829	$1,021,531,939	$346,342,518	$334,401,925	$959,445,414	$959,375,400
Operating expenses	1,626,731,579	1,583,813,833	739,825,185	716,344,426	246,040,095	230,038,511	640,866,299	637,430,896
Net operating revenue	734,504,182	731,495,431	315,622,644	305,187,513	100,302,423	104,363,414	318,579,115	321,944,504
Outside operations—								
Revenues	57,683,010	56,667,268	33,219,833	32,283,258	2,970,054	3,139,627	21,493,123	21,244,383
Expenses	57,188,663	55,540,184	32,750,949	31,574,780	3,013,502	3,154,763	21,424,212	20,810,641
Net revenue from outside operations	494,347	1,127,084	468,884	708,478	[2] 43,448	[2] 15,136	68,911	433,742
Total net revenue	734,998,529	732,622,515	316,091,528	305,895,991	100,258,975	104,348,278	318,648,026	322,378,246
Taxes accrued	94,371,832	84,348,542	42,642,370	37,662,642	12,813,858	12,354,691	38,915,604	34,331,209
Operating income	640,626,697	648,273,973	273,449,158	268,233,349	87,445,117	91,993,587	279,732,422	288,047,037

[1] The assignment of carriers among the several districts is necessarily arbitrary in those cases in which carriers operate in more than one of them.
[2] Deficit.

Owing to mergers and consolidations and to fluctuations in earnings, the identity of the carriers included in the foregoing statement differs slightly from that of those included in last year's statement. This has necessitated a recast of the 1911 figures in order to include the same corporations as are included in 1912. It should also be stated that, owing to a slight modification in territorial classification, the Chicago & Alton is now included in the Western district.

Examination of these figures shows that during the last year the operating income of the 27 larger carriers in the Eastern district increased about in proportion to the increase in operated mileage, while in the other two districts it not only did not increase in proportion to mileage, but it fell somewhat in absolute amount from the 1911 figures. For the entire country the 63 carriers included show operating revenues increased very slightly in proportion to mileage and operating expenses increased in somewhat greater proportion than revenues, so that net operating revenue increased less than one-half of 1 per cent in absolute amount. On a mileage basis, it decreased about 1 per cent. Tax charges, however, increased nearly 12 per cent in absolute amount and more than 10 per cent in the average per mile operated, so that total operating income decreased by more than 1 per cent.

The monthly reports of revenues and expenses required to be filed by railway carriers show for August and subsequent months of the fiscal year not only figures for the particular month covered by the report, but also cumulative figures from July 1, the beginning of the fiscal year. The report for June thus gives figures for the entire fiscal year, and from the June reports of railway carriers having operating revenues for the year 1912 in excess of $1,000,000, the following figures have been compiled:

Summary of monthly reports of revenues and expenses of steam roads reporting total annual operating revenues in excess of $1,000,000.

Item.	Year ended June 30—		Average per mile of road operated.	
	1912	1911	1912	1911
Average number of miles of road operated	219,372.87	216,194.00	.....	.....
Operating revenues:				
Freight	$1,900,628,713.42	$1,861,329,431.20	$8,663.92	$8,609.53
Passenger	640,876,911.47	637,846,154.33	2,921.41	2,950.34
Other transportation	191,136,904.81	187,581,077.77	884.96	867.65
Nontransportation	28,703,694.07	25,902,266.84	130.85	119.81
Total	2,764,346,223.77	2,712,658,930.14	12,601.14	12,547.33
Operating expenses:				
Maintenance of way and structures	351,076,420.01	350,741,223.78	1,600.36	1,622.35
Maintenance of equipment	437,608,351.59	420,355,393.02	1,994.82	1,944.34
Traffic	59,209,686.09	57,636,163.10	269.91	266.60
Transportation	993,266,163.15	962,971,797.10	4,527.75	4,454.20
General	69,096,600.36	68,246,761.65	314.98	315.67
Total	1,910,257,221.20	1,859,951,338.65	8,707.82	8,603.16

Summary of monthly reports of revenues and expenses of steam roads reporting total annual operating revenues in excess of $1,000,000—Continued.

Item.	Year ended June 30—		Average per mile of road operated.	
	1912	1911	1912	1911
Net operating revenue:				
Rail operations	$854,089,002.57	$852,707,591.49	$3,893.32	$3,944.17
Outside operations	487,862.40	1,257,360.41	2.22	5.82
Total net operating revenue	854,576,864.97	853,964,951.90	3,895.54	3,949.99
Taxes	116,909,458.76	104,683,022.31	532.92	484.21
Operating income	737,667,406.21	749,281,929.59	3,362.62	3,465.78

In connection with the foregoing, it should be borne in mind that the reports from which these figures are derived include those rendered by switching and terminal companies with revenues above the limit indicated. The amounts shown above for taxes include only those charged to income account by the *operating* companies whose reports enter into the compilation. Taxes charged to income account by lessor and other nonoperating companies not making monthly returns are not included, and to this extent the tax burden on the operating property is thus not fully shown.

From the latest monthly reports of revenues and expenses of railway carriers received prior to the time of preparation of this report to Congress, the following figures covering the three months subsequent to June 30, 1912, are compiled. Figures for corresponding periods of the last five preceding years are given for comparison. As similar monthly reports of revenues and expenses were not required prior to July 1, 1907, it is impossible to carry the comparison to any earlier period, but the six years covered by the comparison give a period sufficiently long to furnish the basis for a reasonably satisfactory judgment of the present trend of railway revenues.

Operating revenues and expenses of steam roads in the United States reporting annual operating revenues in excess of $1,000,000.

Item.	July, August, and September, 1912.	July, August, and September, 1911.	July, August, and September, 1910.	July, August, and September, 1909.	July, August, and September, 1908.	July, August, and September, 1907.
Average number of miles operated	220,311.72	218,202.20	214,024.11	207,439.89	202,159.24	199,350.85
Freight revenue	$528,256,180.61	$472,098,435.91	$477,456,547.56	$447,952,655.59	$393,638,523.68	$457,934,415.58
Passenger revenue	193,720,381.63	188,931,737.53	186,444,457.76	176,853,629.37	155,873,903.05	169,226,569.49
Other transpor ation revenue	51,693,413.91	47,972,219.15	46,098,076.54	42,468,682.08	38,596,369.29	41,640,204.66
Nontransportation revenue	8,310,997.61	6,964,817.98	6,406,370.29	5,749,966.94	5,016,858.07	5,924,529.29
Total operating revenues	781,980,973.76	715,967,210.57	716,405,452.15	673,024,933.98	593,125,654.09	674,725,719.02
Maintenance of way and structures	105,097,828.43	97,493,143.61	101,273,926.57	92,856,289.35	77,906,204.24	93,922,065.90
Maintenance of equipment	120,824,299.04	107,307,219.41	103,815,458.82	96,505,646.78	85,173,833.53	105,086,216.64
Traffic expenses	15,093,952.38	14,834,445.63	15,076,084.47	13,322,372.47	11,424,191.70	12,328,269.07
Transportation expenses	251,753,578.31	232,865,561.61	233,453,780.13	201,524,538.34	188,810,871.91	219,833,558.81
General expenses	17,055,545.23	16,607,625.66	16,244,889.03	14,633,242.32	13,705,704.67	14,058,935.23
Total operating expenses	509,825,203.39	469,107,995.92	469,864,139.02	418,842,089.26	377,020,806.05	445,229,045.74
Net operating revenue	272,155,770.37	246,859,214.65	246,541,313.13	254,182,844.72	216,104,848.04	229,496,673.28
Net revenue—Outside operations	1,508,506.57	1,260,873.93	1,194,467.39	1,626,033.65	2,075,215.52	2,155,142.49
Total net revenue from operation	273,664,276.94	248,120,088.58	247,735,780.52	255,808,878.37	218,180,063.56	231,651,815.77
Taxes accrued	30,318,148.26	27,953,469.11	25,979,407.27	23,261,547.73	20,904,154.00	19,619,629.94
Gross operating income	243,346,128.68	220,166,619.47	221,756,373.25	232,547,330.64	197,275,909.56	212,032,185.83

AVERAGES PER MILE OF LINE OPERATED.

Freight revenue	$2,397.77	$2,163.58	$2,230.85	$2,159.43	$1,947.17	$2,297.13
Passenger revenue	879.30	865.86	871.14	852.55	771.04	848.89
Other transportation revenue	234.64	219.85	215.39	204.73	190.92	208.87
Nontransportation revenue	37.72	31.92	29.93	27.72	24.82	29.72
Total operating revenues	3,549.43	3,281.21	3,347.31	3,244.43	2,933.95	3,384.61
Maintenance of way and structures	$477.04	$446.80	$473.19	$447.63	$385.37	$471.14
Maintenance of equipment	548.42	491.78	485.07	465.22	421.32	527.14
Traffic expenses	68.51	67.99	70.44	64.22	56.51	61.84

Transportation expenses	1,142.72	1,067.20	1,090.78	971.49	933.97	1,102.75
General expenses	77.42	76.11	75.90	70.54	67.80	70.52
Total operating expenses	2,314.11	2,149.88	2,195.38	2,019.10	1,864.97	2,233.39
Net operating revenue	1,235.32	1,131.33	1,151.93	1,225.33	1,068.98	1,151.22
Net revenue—Outside operations	6.85	5.78	5.58	7.84	10.27	10.81
Total net revenue from operations	1,242.17	1,137.11	1,157.51	1,233.17	1,079.25	1,162.03
Taxes accrued	137.62	128.11	121.38	112.14	103.41	98.42
Gross operating income	1,104.55	1,009.00	1,036.13	1,121.03	975.84	1,063.61

The distribution of the route mileage of the principal express companies over the lines of various classes of carriers on June 30, 1912, and 1911, is shown below.

Classification of mileage covered by operations of express companies on June 30, 1912 and 1911.

Name of carrier.	Total mileage.		Steam road mileage.		Electric line mileage.		Steamboat line mileage.		Stage line mileage.	
	1912	1911	1912	1911	1912	1911	1912	1911	1912	1911
Total	283,348.57	270,438.73	248,628.27	243,472.77	7,736.87	7,291.94	26,328.31	18,952.65	655.12	721.37
Adams Express Co	37,306.26	36,560.52	32,520.19	32,784.94	426.07	314.58	4,333.00	3,438.00	27.00	23.00
American Express Co	59,387.52	56,891.99	56,402.09	54,358.04	653.18	590.70	2,308.75	1,919.75	23.50	23.50
Canadian Express Co	7,406.31	7,243.31	6,559.31	6,400.31	66.00	66.00	759.00	750.00	22.00	27.00
Canadian Northern Express Co	5,255.49	3,391.80	5,233.49	3,369.80	22.00	22.00				
Globe Express Co	2,903.63	2,903.63	2,903.63	2,903.63						
Great Northern Express Co	9,050.02	8,803.54	8,644.83	8,466.15	203.19	197.39	202.00	140.00		
National Express Co	1,626.89	1,640.25	1,408.89	1,422.25	70.00	70.00	148.00	148.00		
Northern Express Co	7,733.55	7,685.88	7,456.85	7,370.43	55.70	54.40	221.00	261.00		
Pacific Express Co	(1)	16,657.98	(1)	15,615.44	(1)	539.20	(1)	503.34		
Southern Express Co	32,948.60	32,580.60	32,047.60	31,654.60	80.00	80.00	821.00	846.00		
United States Express Co	32,800.60	32,748.28	28,817.15	28,836.99	3,516.75	3,444.59	466.70	466.70		
Wells Fargo & Co	81,995.01	58,471.56	61,711.55	45,446.75	2,639.98	1,909.08	17,064.86	10,475.86	578.62	639.87
Western Express Co	4,934.69	4,859.39	4,922.69	4,843.39	4.00	4.00	4.00	4.00	4.00	8.00

[1] On Aug. 1, 1911, Wells Fargo & Co. extended its service over all lines formerly operated by the Pacific Express Co.

From the annual reports of express companies for the last fiscal year are also compiled the following figures, showing grand totals of income-account items. Similar figures for the preceding year are also shown for purposes of comparison. The figures for the last year are as reported; those for the preceding year have had the benefit of revision.

Statement of income account of express companies for the years ended June 30, 1912 and 1911, as shown in annual reports to the Interstate Commerce Commission.

Item.	Grand total—12 companies in 1912 and 13 companies in 1911.			
	1912		1911	
Operating income:				
Express operations—				
Gross receipts from operation	[1] $160,121,932.57		$152,612,880.16	
Express privileges—Dr.	[1] 78,576,274.15		73,936,018.09	
Operating revenues		[1] $81,545,658.42		$78,676,862.07
Operating expenses		[1] 73,255,682.02		67,089,232.74
Net operating revenue		[1] 8,289,976.40		11,587,629.33
Outside operations—				
Revenues	267,390.20		263,151.43	
Expenses	314,013.11		250,034.17	
Net revenue from outside operations		*46,622.91*		13,117.26
Total net revenue		8,243,353.49		11,600,746.59
Taxes accrued		1,430,809.25		1,315,973.14
Operating income		6,812,544.24		10,284,773.45
Other income:				
Separately operated properties—Profit	72,268.97		137,103.09	
Dividends declared on stocks owned or controlled	2,622,567.35		3,268,914.74	
Interest accrued on funded debt owned or controlled	1,842,469.10		1,656,071.56	
Net income from miscellaneous investments—Physical property	177,036.06		181,273.28	
Miscellaneous income	655,481.01		1,072,479.80	
Total other income		5,369,822.49		6,315,842.47
Gross income		12,182,366.73		16,600,615.92
Deductions from gross income:				
Separately operated properties—Loss	14,563.14		6,487.52	
Interest accrued on funded debt	816,610.67		820,239.45	
Other interest	138,526.91		175,537.29	
Extinguishment of discount on securities	16,666.67			
Net loss on miscellaneous investments—Physical property	3,259.10			
Other deductions	248,369.53		231,742.63	
Total deductions		1,237,996.02		1,234,006.89
Net corporate income		10,944,370.71		15,366,609.03
Disposition of net corporate income:				
Dividends declared from current income		[2] 4,625,832.11		[2] 5,848,082.74
Appropriations for additions and betterments		48,965.27		30,941.41
Appropriations for other reserves		5,054.89		
Balance for year carried forward to credit of profit and loss		6,264,518.44		9,487,584.88

[1] The Pacific Express Co. discontinued business on July 31, 1911. Because of the want of a complete report covering the month of July, the following figures are taken from the report of revenues and expenses for that month: Gross receipts from operation, $439,050.19; express privileges—dr., $213,407.20; operating revenues, $225,642.99; operating expenses, $201,278.92; and net operating revenue, $24,364.07. These figures are not included in the 1912 totals.

[2] Besides the dividends declared from income, dividends were declared from surplus in the two years as follows: In 1912, $2,823,784.91, and in 1911, $8,496,960.11.

As illustrative of the Pullman service, the following figures from the report of The Pullman Co. for the month of September, 1912, are given:

Summary statement of revenues and expenses reported by The Pullman Co.

Item.	For the month of September.			From the beginning of the fiscal year to the end of September.		
	Current fiscal year (July 1, 1912, to June 30, 1913).	Preceding fiscal year (July 1, 1911, to June 30, 1912).	Increase or *decrease.*	Current fiscal year (July 1, 1912, to June 30, 1913).	Preceding fiscal year (July 1, 1911, to June 30, 1912).	Increase or *decrease.*
CAR OPERATIONS.						
Berth revenue	$3,330,878.49	$3,107,188.75	$223,689.74	$9,676,716.62	$9,162,749.40	$513,967.22
Seat revenue	606,789.59	578,864.77	27,924.82	1,871,096.07	1,784,674.36	86,421.71
Charter of cars	46,417.53	65,470.91	*19,053.38*	169,419.44	176,868.05	*7,448.61*
Miscellaneous revenue	6,365.66	5,310.02	1,055.64	18,265.92	15,912.65	2,353.27
Car mileage revenue	74,740.48	83,174.50	*8,434.02*	246,141.70	258,304.13	*12,162.43*
Association revenue—Dr.	57,373.20	58,680.39	*1,307.19*	185,265.78	190,078.80	*4,813.02*
Contract revenue—Dr.	98,271.15	56,031.85	42,239.30	352,824.57	275,515.80	77,308.77
Total operating revenues	3,909,547.40	3,725,296.71	184,250.69	11,443,549.40	10,932,913.99	510,635.41
Maintenance of cars	969,819.84	1,022,295.34	*52,475.50*	2,842,827.19	3,086,167.14	*243,339.95*
All other maintenance	9,081.13	1,224.44	7,856.69	45,303.16	4,254.59	41,048.57
Conducting car operations	998,469.19	916,587.29	81,881.90	2,956,121.52	2,810,116.24	146,005.28
General expenses	77,900.60	65,519.89	12,380.71	237,217.11	221,248.79	15,968.32
Total operating expenses	2,055,270.76	2,005,626.96	49,643.80	6,081,468.98	6,121,786.76	*40,317.78*
Net operating revenue	1,854,276.64	1,719,669.75	134,606.89	5,362,080.42	4,811,127.23	550,953.19
AUXILIARY OPERATIONS.						
Total revenues	86,037.70	86,310.61	*272.91*	269,715.42	271,514.45	*1,799.03*
Total expenses	91,415.09	80,112.29	11,302.80	278,602.93	283,284.39	*4,681.46*
Net revenue	*5,377.39*	6,198.32	*11,575.71*	*8,887.51*	*11,769.94*	2,882.43
Total net revenue	1,848,899.25	1,725,868.07	123,031.18	5,353,192.91	4,799,357.29	553,835.62
Taxes accrued	75,000.00	70,000.00	5,000.00	225,000.00	241,935.33	*16,935.33*
Operating income	1,773,899.25	[1] 1,655,868.07	118,031.18	5,128,192.91	[1] 4,557,421.96	570,770.95

	Miles.
Total railway mileage over which respondent conducted operations on July 31, 1912	125,991
On corresponding date of previous year	125,112

[1] Does not include amount reported for uncollected ticket revenue for unused tickets.

An investigation was begun by the Division of Statistics in November, 1911, for the purpose of obtaining information as to the number and location of telephone companies engaged in interstate commerce. A circular containing inquiries relative to the character and amount of business done by individual companies was mailed to approximately 25,000 addresses which, on current information, were believed to be operating concerns. The response to this circular was general, bringing to hand a large mass of pertinent facts connected with location of plants, forms of operating organization, and conditions of operation in various parts of the United States. By the arrangement

and indexing of the returns made by the companies, there is now accessible for the future work of the division a record embracing nearly all the larger commercial telephone companies of the United States, together with a great portion of the thousands of rural lines which are operated for local convenience in the farming districts. The results of our inquiries have shown that the assembling of correct lists of these rural lines is a matter of much difficulty. As a mass, the rural lines form an important part of the national telephone system, since they serve as feeders and terminals of the urban commercial systems. The units of the mass, however, are characterized by lack of fixed designation, shifting operating centers, fluctuating mileage, indefinite and changing status as to commercial character, and other peculiarities which make the handling of returns from them much more difficult than is the case with the great transportation companies.

The work of this division relating to carriers by water has been greatly advanced during the past year by a decision of the United States Supreme Court handed down on April 1, 1912. The principle declared is of so great importance that it is proper to review briefly the history of the litigation that called for the decision. On June 11, 1910, the Interstate Commerce Commission entered an order approving a special report series circular calling for statistics from every carrier within the jurisdiction of the Commission. The purpose of the order and circular was, as stated, to "enable the Commission to determine the form for annual report" to be required from carriers by water. Action was brought by certain carriers seeking to annul this and other orders of the Commission. These cases were heard in the Commerce Court, which decreed that the orders be set aside and the matter be "referred to the Interstate Commerce Commission to proceed with according to right and justice." The cases were then appealed to the Supreme Court of the United States, and this court, speaking through Mr. Justice Day, said:

> If the Commission is to be informed of the business of the corporation, so far as its bookkeeping and reports are concerned, it must have full knowledge and full disclosures thereof, in order that it may ascertain whether forbidden practices and discriminations are concealed, even unintentionally, in certain accounts and whether charges of expense are made against one part of a business which ought to be made against another.

And again:

> Bookkeeping may and ought to show how a business which, in part at least, is interstate commerce is carried on, in order that the Commission, charged with the duty of making reasonable rates and prohibiting unfair and unreasonable ones, may know the nature and extent of the business of the corporation, the cost of its interstate transactions, and otherwise to inform itself so as to enable it to properly regulate the matters which are within its authority.

In accordance with these statements, the court further said:

> We think the uniform system of accounting prescribed and the report called for are such as it is within the power of the Commission to require under section 20 of the act. Nor do the requirements exceed the constitutional authority of Congress to pass such a law. It therefore follows that the Commerce Court erred in granting the injunctions and remanding the cases to the Commission with instructions to recast its orders.

Following this opinion, with few exceptions, the water-line carriers within the Commission's jurisdiction filed the special report, and most of them have expressed their readiness to cooperate with the Commission in working out details of an accounting system and suitable form of annual report. While the details for an annual report form have not been fully settled, it may be assumed that the interrogatories therein will call for exact information as to the amount of capital stock issued and dividends paid, funded debt and interest thereon, cost and value of the carrier's property and equipment, earnings and receipts from all sources, operating statistics, as well as other facts necessary to exhibit the carrier's financial condition and the results from operation of its business.

Thus far the accounting classifications issued for carriers by water are merely those of operating revenues and operating expenses, though a complete system of accounts is now being prepared and will probably become effective at an early date. The schedules resulting therefrom will be incorporated in the annual report form to be prescribed for all carriers by water that are subject to the jurisdiction of the Commission.

During the past year the jurisdiction of the Interstate Commerce Commission over carriers by water has been extended by the provisions of the Panama Canal act.

The act to regulate commerce applies to carriers by water only when engaged in transportation "partly by railroad and partly by water when both are used under a common control, management, or arrangement for a continuous carriage or shipment." Section 11 of the Panama Canal act amends section 5 of the act to regulate commerce by adding a paragraph which may be summed up in the following words: From and after July 1, 1914, it shall be unlawful for any common carrier subject to the act to own or to have any interest whatsoever in any common carrier by water or any vessel with which the aforesaid common carrier does or may compete for traffic. The Commission is given jurisdiction to determine questions of fact as to the competition or possibility of competition, and may, if it is of the opinion that the existing service by water other than through the Panama Canal is of advantage to the convenience and commerce of the people, extend the time during which such service

by water may be operated beyond July 1, 1914. Section 11 also provides that:

> In every case of such extension the rates, schedules, and practices of such water carrier shall be filed with the Interstate Commerce Commission and shall be subject to the act to regulate commerce and all amendments thereto in the same manner and to the same extent as is the railroad or other common carrier controlling such water carrier or interested in any manner in its operation.

It will be observed that, under this wording of the law, the jurisdiction of the Interstate Commerce Commission extends over the rates, schedules, and practices of such carriers *filed with the Commission*. Apparently the intention of Congress was to bring the traffic of these carriers under the provisions of the act to regulate commerce in the same manner and to the same extent as is the traffic of the carriers controlling them. Under this assumption the controlled carrier would be subject to all the provisions of the act to regulate commerce, or, to state the matter in another way, the Commission would be charged with the duty of inquiring as to the management of the business in order to keep itself informed as to the manner in which the same is conducted and would have the right to compel the disclosure of full information as to the manner in which said carriers are conducting their business. It seems impossible that the Interstate Commerce Commission could perform the duties imposed upon it without having such information.

From the foregoing it will be seen that the Commission's jurisdiction under the act to regulate commerce, as amended by the Panama Canal act, extends:

(1) To carriers by water when engaged in transportation handled partly by rail and partly by water when both are used under a common control, management, or arrangement for a continuous carriage or shipment;

(2) To carriers by water or vessels when such carriers or vessels are under the control of a railroad or other common carrier with which they compete or may compete.

This leaves carriers that are engaged in transportation wholly by water independent of regulation, so long as they are not controlled by other carriers.

RAILWAY ACCIDENTS.

The following summary of railway accidents is compiled from the monthly reports of carriers made to the Interstate Commerce Commission as required under the act of May 6, 1910, for the year ended June 30, 1912.

It shows the total number of casualties for the year on steam roads to be 180,123, of which 10,585 is the number of persons killed and 169,538 represents the number injured, showing an increase of 189 in total number of persons killed and 19,379 in the number injured.

Of this number 400 railway employees killed and 92,363 injured were reported under the head of "Industrial accidents." This class includes accidents to railway employees in and around shops, on boats and wharves, at stations, freight houses, engine houses, coaling stations, water stations, on tracks, on construction, repair, or painting of buildings, and such other accidents as do not occur in connection with the movement of locomotives or cars on rails.

An analysis of the figures for the year under review shows that of the number killed 3,635 were employees, 318 passengers, and 6,632 other persons, trespassing and not trespassing, showing an increase of 33 in the total number of employees killed, a decrease of 38 in the total number of passengers killed, and an increase of 194 in the total number of persons killed other than employees and passengers.

Of the persons injured 142,442 were employees, 16,386 passengers, and 10,710 persons other than employees and passengers. These figures show an increase of 16,403 in the number of employees, 2,953 in the number of passengers, and 23 in the number of other persons injured, when comparison is made with the returns for the year 1911.

Summary of casualties to persons, years ended June 30.

	Steam.				Electric.			
	1912		1911		1912		1911	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Passengers:								
In train accidents	139	9,391	142	6,722	7	1,462	75	1,182
Other causes	179	6,995	214	6,711	28	1,400	30	1,101
Total	318	16,386	356	13,433	35	2,862	105	2,283
Employees on duty:								
In train accidents	596	7,098	620	6,601	14	144	16	121
In coupling accidents	192	3,234	209	2,966	2	18	2	13
Overhead obstructions, etc	77	1,523	76	1,510	.....	22	3	18
Falling from cars, etc	573	13,874	539	12,989	13	96	10	95
Other causes	1,482	23,391	1,427	21,782	17	159	20	116
Total	2,920	49,120	2,871	45,848	46	439	51	363
Total passengers and employees on duty	3,238	65,506	3,227	59,281	81	3,301	156	2,646

Summary of casualties to persons, years ended June 30—Continued.

	Steam.				Electric.			
	1912		1911		1912		1911	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Employees not on duty:								
In train accidents	20	156	13	174	.....	11	.....	5
In coupling accidents	.....	2	.....	.....	.....	.....	.....	.....
Overhead obstructions	1	12	2	13	.....	1	.....	.....
Falling from cars, etc	53	312	49	357	1	11	.....	9
Other causes	241	477	228	410	.....	1	4	4
Total	315	959	292	954	1	24	4	18
Other persons:								
Not trespassing—								
In train accidents	13	277	11	175	.....	7	1	5
Other causes	1,185	4,746	1,143	4,898	118	652	132	476
Total	1,198	5,023	1,154	5,073	118	659	133	481
Trespassers—								
In train accidents	91	151	81	141	.....	.....	.....	.....
Other causes	5,343	5,536	5,203	5,473	100	128	117	119
Total	5,434	5,687	5,284	5,614	100	128	117	119
Total accidents involving train operation	10,185	77,175	9,957	70,922	300	4,112	410	3,264
Industrial accidents to employees not involving train operation	400	92,363	439	79,237	24	550	10	399
Grand total	10,585	169,538	10,396	150,159	324	4,662	420	3,663

The following tables show the causes of derailments in greater detail than has heretofore been published. The figures given show that of the total 8,215 derailments during the year ended June 30, 1912, 1,877 were caused by defects of roadway, 3,847 were due to defects of equipment. This shows an increase of 652 in the number of derailments due to defects of roadway, and 1,023 in the number due to defects of equipment, when comparison is made with the figures for the same period of 1911.

The larger number of derailments in the class reported under defects of equipment was due to broken flange, there being 627 from that cause out of the total of 3,847, and irregular track was responsible for the larger number under defective roadway, causing 531 out of a total of 1,877.

Derailments.

DUE TO DEFECTS OF EQUIPMENT.

Cause of accident.	Year ended June 30, 1912.				Year ended June 30, 1911.			
	Number of accidents.	Killed.	Injured.	Damage to road and equipment and cost of clearing wrecks.	Number of accidents.	Killed.	Injured.	Damage to road and equipment and cost of clearing wrecks.
Defective wheels:								
Broken or burst wheel	357	3	27	$371,938	235	6	34	$281,985
Broken flange	627	8	64	605,882	581	11	72	582,360
Loose wheel	124	2	20	97,671	103	.....	28	89,073
Miscellaneous	127	2	169	109,413	78	1	43	55,047
Broken or defective axle or journal	410	2	104	302,146	355	9	88	310,782
Broken or defective brake rigging	528	4	157	411,294	382	9	131	289,968
Broken or defective draft gear	177	6	48	110,456	131	2	29	77,572
Broken or defective side bearings	177	1	94	125,785	79	4	39	66,595
Broken arch bar	257	8	130	275,828	119	1	7	136,370
Rigid trucks	184	2	66	124,979	55	1	30	40,315
Failure of power-brake apparatus, hose, etc	216	5	29	107,203	168	1	28	78,078
Failure of couplers	208	2	30	98,892	185	.....	27	94,264
Miscellaneous	455	23	259	423,546	353	19	133	276,665
Total	3,847	68	1,197	3,165,033	2,824	64	689	2,379,074

DUE TO DEFECTS OF ROADWAY.

Broken rail	363	52	1,065	$511,778	249	12	463	$292,749
Spread rail	251	6	256	154,235	153	4	192	102,433
Soft track	327	13	294	228,079	108	1	128	66,192
Bad ties	52	.....	30	20,492	41	.....	17	18,972
Sun kink	22	2	61	11,214	30	3	62	51,207
Irregular track	531	15	743	389,591	179	5	130	122,526
Miscellaneous	331	14	317	226,071	465	32	568	353,381
Total	1,877	102	2,766	1,541,460	1,225	57	1,560	1,007,460

Summary of accidents resulting from collisions and derailments for 11 years ended June 30, 1912.[1]

Year.	Number of accidents.	Loss.	Killed.	Injured.
1902	8,675	$7,645,406	821	7,937
1903	10,643	9,596,977	987	9,844
1904	11,291	9,383,077	1,018	10,244
1905	11,595	9,711,656	1,064	11,949
1906	13,455	10,659,189	977	12,686
1907	15,458	12,865,702	1,291	16,236
1908	13,034	10,183,660	728	12,834
1909	9,670	7,480,203	606	9,560
1910	11,779	9,823,958	778	12,579
1911	11,865	9,851,780	785	11,793
1912	13,698	11,527,458	772	15,096

[1] Figures for number of persons killed and injured for years prior to 1911 are restricted to passengers and employees on duty.

Derailments due to defects of equipment, 11 years ended June 30, 1912.[1]

Year.	Number of accidents.	Killed.	Injured.	Damage to road and equipment and cost of clearing wrecks.	Number of accidents.	Killed.	Injured.	Damage to road and equipment and cost of clearing wrecks.
	BROKEN OR BURST WHEELS.				BROKEN WHEEL FLANGE.			
1902	172	4	43	$189,953	290	1	37	$289,091
1903	162	3	20	165,735	387	3	52	408,984
1904	240	9	51	271,298	493	11	73	555,453
1905	235	6	88	337,999	581	2	94	507,432
1906	182	1	23	212,803	649	12	135	543,773
1907	242	8	73	264,692	693	9	107	675,134
1908	234	.....	41	270,097	582	7	94	614,967
1909	220	.....	15	246,286	518	6	73	497,712
1910	241	4	19	256,074	619	3	88	583,972
1911	235	6	34	281,985	581	11	72	582,360
1912	357	3	27	371,938	627	8	64	605,882
Total	2,520	44	434	2,868,860	6,020	73	889	5,864,760

Year.	LOOSE WHEEL.				MISCELLANEOUS.			
1902	44	.....	14	$52,519	43	1	39	$27,865
1903	53	.....	13	33,623	67	5	23	53,195
1904	77	3	27	47,515	89	5	50	67,828
1905	69	.....	16	38,422	96	6	57	57,434
1906	85	.....	15	72,772	85	3	62	58,335
1907	132	3	95	127,210	142	8	74	77,535
1908	98	1	22	54,674	117	1	66	55,266
1909	101	1	56	82,799	74	1	50	37,115
1910	105	1	39	120,418	81	2	67	48,201
1911	103	.....	28	89,073	78	1	43	55,047
1912	124	2	20	97,671	127	2	169	109,413
Total	991	11	345	816,696	999	35	700	647,234

Year.	BROKEN OR DEFECTIVE AXLE OR JOURNAL.				BROKEN OR DEFECTIVE BRAKE RIGGING.			
1902	307	2	45	$216,108	138	1	14	$102,838
1903	277	.....	42	220,784	171	6	65	101,290
1904	338	7	100	288,231	178	3	36	140,474
1905	327	4	74	249,133	218	5	67	163,023
1906	357	5	87	274,866	292	4	109	226,096
1907	425	2	48	274,498	379	9	151	335,696
1908	351	4	70	233,222	427	6	225	327,100
1909	289	2	46	214,735	294	3	134	204,946
1910	337	1	41	281,100	363	6	119	251,252
1911	356	9	88	310,782	382	9	131	289,968
1912	410	2	104	302,146	528	4	157	411,294
Total	3,773	38	745	2,865,605	3,370	56	1,208	2,553,977

Year.	BROKEN OR DEFECTIVE DRAFT GEAR.				BROKEN OR DEFECTIVE SIDE BEARINGS.			
1902	95	1	8	$57,772	18	.....	8	$9,078
1903	111	3	20	57,794	24	.....	6	14,605
1904	133	.....	29	81,538	26	1	20	12,503
1905	232	1	38	154,639	30	1	32	17,429
1906	232	.....	44	142,384	33	.....	15	11,601
1907	237	1	55	134,043	65	1	11	36,555
1908	174	2	35	80,200	69	.....	22	41,354
1909	105	1	20	46,912	42	2	33	39,779
1910	148	1	17	87,931	55	1	5	41,523
1911	131	2	29	77,572	79	4	39	66,595
1912	177	6	48	110,456	177	1	94	125,785
Total	1,775	18	343	1,031,241	618	11	285	416,807

[1] Figures for number of persons killed and injured for years prior to 1911 are restricted to passengers and employees on duty.

Derailments due to defects of equipment, 11 years ended June 30, 1912[1]—Continued.

Year.	Number of accidents.	Killed.	Injured.	Damage to road and equipment and cost of clearing wrecks.	Number of accidents.	Killed.	Injured.	Damage to road and equipment and cost of clearing wrecks.
	BROKEN ARCH BAR.				RIGID TRUCKS.			
1902	35	1	19	$30,196	42	.....	41	$18,787
1903	57	.....	12	63,482	56	.....	23	25,544
1904	66	1	6	49,154	42	.....	16	23,057
1905	62	2	65	55,097	46	.....	20	32,409
1906	105	1	25	117,882	76	.....	58	38,430
1907	109	1	23	86,638	91	.....	22	43,283
1908	136	4	47	118,517	76	.....	21	37,452
1909	129	.....	55	117,754	43	.....	20	31,607
1910	144	.....	30	140,810	68	4	24	37,154
1911	119	1	7	136,370	55	1	30	40,315
1912	257	8	130	275,828	184	2	66	124,979
Total	1,219	19	419	1,191,728	779	7	341	453,017

Year.	FAILURE OF POWER-BRAKE APPARATUS, HOSE, ETC.				FAILURE OF COUPLERS.			
1902	100	3	30	$64,398	151	2	14	$96,321
1903	89	.....	6	40,639	158	.....	20	90,108
1904	158	3	31	123,367	198	4	28	103,724
1905	258	3	75	141,161	212	1	24	97,782
1906	213	6	33	144,713	229	4	42	89,719
1907	122	4	14	82,056	145	.....	18	66,728
1908	92	4	19	60,889	103	2	23	47,086
1909	141	2	21	75,472	169	4	18	78,658
1910	182	7	30	101,092	121	.....	14	50,461
1911	168	1	28	78,078	185	.....	27	94,264
1912	216	5	29	107,203	208	2	30	98,892
Total	1,739	38	316	1,019,068	1,879	19	258	913,743

Year.	MISCELLANEOUS.				GRAND TOTAL.			
1902	174	9	84	$140,373	1,609	25	396	$1,295,299
1903	229	4	112	226,542	1,841	24	414	1,502,325
1904	259	13	163	189,250	2,297	60	630	1,953,392
1905	239	9	148	216,660	2,605	40	798	2,068,620
1906	273	6	154	292,779	2,811	42	802	2,226,153
1907	396	13	235	285,960	3,178	59	926	2,490,028
1908	337	6	146	235,370	2,796	37	831	2,176,194
1909	237	6	90	201,871	2,362	28	631	1,875,646
1910	270	10	143	227,364	2,734	40	636	2,227,352
1911	353	19	133	276,665	2,824	64	689	2,379,074
1912	455	23	259	423,546	3,847	68	1,197	3,165,033
Total	3,222	118	1,667	2,716,380	28,904	487	7,950	23,359,116

[1] Figures for number of persons killed and injured for years prior to 1911 are restricted to passengers and employees on duty.

Derailments due to defect of roadway for 11 years ended June 30, 1912.[1]

Year.	Number.	Killed.	Injured.	Damage.	Number.	Killed.	Injured.	Damage.
	BROKEN RAIL.				SPREAD RAIL.			
1902	78	5	207	$128,769	60	.....	132	$22,508
1903	150	12	204	166,140	106	6	94	51,245
1904	176	9	139	157,682	115	2	107	58,410
1905	201	4	465	257,519	168	7	183	103,565
1906	220	7	635	254,862	168	2	146	101,611
1907	308	12	699	284,675	206	5	166	109,607
1908	238	16	433	296,327	200	1	164	138,160
1909	196	5	498	191,842	130	2	94	65,811
1910	243	24	389	293,899	171	7	152	147,597
1911	249	12	463	292,749	153	4	192	102,433
1912	363	52	1,065	511,778	251	6	256	154,235
Total	2,422	158	5,177	2,836,242	1,728	42	1,686	1,055,182
Year.	SOFT TRACK.				BAD TIES.			
1902	50	3	44	$51,122	8	.....	6	$1,511
1903	101	2	90	83,772	14	1	13	5,877
1904	95	5	106	61,385	25	.....	5	14,058
1905	99	6	111	71,469	19	.....	36	7,723
1906	180	4	166	111,115	25	.....	25	14,473
1907	182	5	216	173,155	45	.....	16	16,955
1908	151	.....	167	136,839	42	.....	43	24,347
1909	114	4	77	72,901	36	.....	5	11,495
1910	110	1	250	74,769	31	1	12	18,096
1911	108	1	128	66,192	41	.....	17	18,972
1912	327	13	294	228,079	52	.....	30	20,492
Total	1,517	44	1,649	1,130,798	338	2	208	153,999
Year.	SUN KINK.				IRREGULAR TRACK.			
1902	9	.....	11	$5,239	85	3	79	$44,514
1903	4	.....	9	2,530	131	5	110	83,162
1904	13	.....	10	23,809	151	3	103	83,267
1905	15	5	101	25,300	154	10	266	104,293
1906	13	1	9	8,113	232	8	226	145,624
1907	18	1	40	33,664	272	5	230	253,296
1908	28	1	93	31,783	211	6	189	144,505
1909	14	1	14	28,749	175	3	96	107,282
1910	28	.....	33	16,372	202	3	225	149,295
1911	30	3	62	51,207	179	5	130	122,526
1912	22	2	61	11,214	531	15	743	389,591
Total	194	14	443	237,980	2,323	66	2,397	1,627,355
Year.	MISCELLANEOUS.				GRAND TOTAL.			
1902	257	9	235	$190,043	547	20	714	$443,706
1903	315	22	299	243,992	821	48	819	636,718
1904	291	14	246	213,927	866	33	716	612,538
1905	351	18	284	207,564	1,007	50	1,446	777,433
1906	449	16	401	282,258	1,287	38	1,608	918,056
1907	497	30	616	383,762	1,528	58	1,983	1,255,114
1908	545	21	472	314,464	1,415	45	1,561	1,086,425
1909	315	9	376	224,009	980	24	1,160	702,089
1910	336	6	290	211,929	1,121	42	1,331	911,957
1911	465	32	568	353,381	1,225	57	1,560	1,007,460
1912	331	14	317	226,071	1,877	102	2,766	1,541,460
Total	4,152	191	4,104	2,851,400	12,674	517	15,664	9,892,956

[1] Figures for number of persons killed and injured for years prior to 1911 are restricted to passengers and employees on duty.

SAFETY APPLIANCES.

During the fiscal year ending June 30, 1912, 192 employees were killed and 3,234 employees were injured while coupling and uncoupling cars.

Casualties resulting from collisions with overhead obstructions and falling from cars aggregated 704 fatalities and 15,721 personal injuries to employees.

During this fiscal year 177 cases, involving 499 violations of the safety-appliance act, were transmitted to the several United States attorneys for prosecution. The railroads confessed judgment during the year as to 338 violations, prosecutions being dismissed as to 23 counts. During the same period 28 cases, involving 144 violations, were tried before the courts, of which 121 counts were decided in favor of the Government and 8 in favor of defendant, decision being reserved as to the remaining 15 counts. Penalties aggregating $40,400, in addition to costs, were collected and paid into the Treasury.

By an order dated March 13, 1911, issued pursuant to the provisions of the act of April 14, 1910, the Commission prescribed the standards to be observed by the carriers in the matter of certain safety appliances, an extension of five years from July 1, 1911, being granted, as to some of the appliances, in which the railroads should render their equipment conformable to the standards specified. Up to the present time, however, but a small percentage of the total number of cars, to which the order is applicable, have been equipped, and unless this work is expedited it can not be completed within the time allowed by the Commission's order.

In many instances it has been found that cars with defective safety appliances were permitted to leave terminals or repair points when but very slight repairs were needed to place them in proper condition. This was due to bad methods of inspection and to failure of the railroads to provide facilities for inspections at points on their lines where inspections should be made.

JUDICIAL INTERPRETATION OF THE SAFETY-APPLIANCE ACT.

In a number of cases in court attempts have been made to discredit the testimony of the Commission's inspectors of safety appliances for the reason that they did not notify the railroad companies of defects they had discovered before defective cars were moved. Several of the district courts have held that there is no legal obligation on the part of the inspectors so to notify a railroad company, and a similar decision has recently been reached by the circuit court of appeals for the fourth circuit in Norfolk & Western Railway Co. *v.* United States (191 Fed., 302).

In Philadelphia & Reading Railway Co. *v.* United States (191 Fed., 1), the circuit court of appeals for the third circuit held that a defective

car hauled by the defendant company over the tracks of another railway company under a contract with the railway company owning the same, but in the control of its own employees, was hauled "on its line" within the meaning of section 6 of the safety-appliance act.

In the case of Atchison, Topeka & Santa Fe Railway Co. *v.* United States (198 Fed., 637), decided in May, 1912, by the circuit court of appeals for the seventh circuit, it was held that Congress in adopting the safety-appliance act had intended that an engineer should be able "to control the speed" of a train moving slowly through a congested region of drawbridges and railroad crossings as efficiently as when moving rapidly on a single clear track in the country. It was also held that the word "brakeman" as used in the act is to be construed in its generic sense as including any and all men whose duties in connection with the movement of a train oblige them to use the common hand brake in the absence of air brakes.

In a more recent case, however, involving a similar state of facts, the circuit court of appeals for the third circuit, in Erie Railroad Co. *v.* United States (197 Fed., 287), without attempting in any way to distinguish the Atchison Case, supra, from the case at bar, assumed the opposite view, and strongly intimated that a movement of this kind was a switching or yard movement. It was further held that in that event, the question being left to the jury, the air-brake provision of the statute did not apply, the act fulfilling its purpose "when it is applied to trains finally made up for road service."

On May 6, 1912, the circuit court of appeals for the ninth circuit, affirming the decision of the District Court for Montana in the case of United States *v.* Chicago, Milwaukee & Puget Sound Railway Co. (196 Fed., 882), referred to in the last annual report, held that the safety-appliance act prohibits the use of an engine with the drawbar on the front end below the minimum height prescribed, even though the defective end may not be used, or may be so obviously defective that no reasonably prudent employee would attempt to use it.

In United States *v.* Southern Railway Co., decided April 11, 1912, by the District Court for the Northern District of Georgia, the jury was instructed that where a train is composed entirely of cars equipped with air brakes, all the cars in the train, or 100 per cent, must have their brakes used and operated by the engineer of the locomotive drawing such train.

In the case of United States *v.* Spokane & Inland Empire Railroad Co., decided September 17, 1912, by the District Court for the Eastern District of Washington (not yet reported), it was held that the safety-appliance act applied to an interurban electric railroad, even though a portion of its track was conjointly used by a local street railway system, it being assumed that Congress intended to exclude

from the application of the statute only those cars which are used exclusively on street railways. It was also held in this case that street cars can not be lawfully chained together and used for the transportation of passengers in interstate traffic.

In a case against the Colorado Midland Railway Co., decided March 14, 1912, by the District Court for the District of Colorado, it was held that the provisions of the act of April 14, 1910, permitting the movement under certain circumstances of damaged cars for the purpose of repair, were applicable to the case at bar, although the violation in question was alleged to have occurred in March, 1910; in other words, that the act of April 14, 1910, was retroactive. On September 16, 1912, this decision was reversed by the circuit court of appeals for the eighth circuit (not yet reported).

ASH-PAN LAW.

During the year covered by this report five cases, involving six violations of the ash-pan act (35 Stat. L., 476), were transmitted to United States attorneys for prosecution. During the same period prosecutions of three violations of the statute were dismissed and defendants confessed judgment as to seven violations. Penalties under the act to the amount of $1,600, in addition to costs, were collected and paid into the Treasury.

HOURS OF SERVICE ACT.

Since the publication of the last annual report the Commission has adopted and prescribed for the use of the carriers a series of amended forms of hours-of-service reports, by which the forms theretofore in effect were superseded on July 1, 1912.

The revised forms embody comprehensive and specific information, and the data thus furnished by the railroads are now being analyzed and tabulated with a view to determining the preventable causes of excess service as a basis of further remedial legislation.

By an order of the Commission, dated June 8, 1912, effective from and after September 1, 1912, the carriers are required to keep on file detailed-train-delay reports, showing the causes and duration of all delays that may have in any way contributed to employees being kept on duty in excess of the statutory period.

Instances in which excessive hours of service have contributed to railroad accidents seem to have almost disappeared, and while the aggregate number of cases of excess service, as reported by the carriers themselves, is still unduly large the decrease in such instances as to individual roads has been appreciable.

There is still, however, an unreasonable number of instances in which delays have been attributed to "hot boxes," "leaky flues," "drawbars out," "engine failing for steam," and other similar

causes, which, apparently, should not be comprehended within the category of excusable delays.

We would therefore again respectfully suggest that Congress define and clarify the terms of the proviso in section 3 of the hours-of-service act to the end that the excepted causes—and those causes only—shall be held to warrant excess service.

The Commission also recommends an amendment to the present law whereby the penalty "of not to exceed $500" shall be changed to a fixed and determinate sum, or that a minimum penalty of $100 be prescribed for each and every violation of the law.

One result already apparent from the operation of the hours-of-service law is that the number of train-miles run for each trainman employed has considerably increased since the law became effective. This increase is especially significant in view of the fact that for a number of years previous to 1908 there was a steady decrease in this item.

During the year ending June 30, 1912, there were transmitted by the Commission to United States attorneys for prosecution 217 cases, involving 2,135 violations. During the year the railroads confessed judgment in 727 counts. Twenty cases, involving an aggregate of 110 violations, were tried, in 82 of which there was a verdict for the Government, the remaining 28 counts being decided in favor of defendants. Two hundred and one counts were dismissed. Penalties aggregating $25,835, in addition to costs, were collected and deposited with the Treasurer of the United States.

A tabulated summary appended to the report, submitted by the chief inspector of safety appliances to the Interstate Commerce Commission, shows the amount collected from each railroad in penalties for violation of the safety-appliance, hours-of-service, and ash-pan acts.

JUDICIAL INTERPRETATION OF THE HOURS-OF-SERVICE ACT.

During the year ending June 30, 1912, several important decisions interpreting the hours-of-service law were announced by the courts.

The Supreme Court, in Northern Pacific Railway Co. *v.* State of Washington (222 U. S., 370), held that the Federal hours-of-service act supersedes all State legislation on the subject. It was further held that the train involved in that proceeding was an interstate train, even though it may also have carried at the same time some local traffic.

The circuit court of appeals for the eighth circuit, in United States *v.* Ramsey, receiver (197 Fed., 144), held that a receiver charged with the operation of a railroad is a common carrier within the meaning of the Federal hours-of-service act.

In United States *v.* Cleveland, Cincinnati, Chicago & St. Louis Railway Co., decided December 12, 1911, but not yet officially reported, the District Court of the United States for the Southern District of Ohio held that the provisions of the act relating to opertors, train dispatchers, and other employees "who by the telegraph or telephone," dispatch, report, transmit, receive, or deliver "orders pertaining to or affecting train movements," apply also to switchmen who are located at particular stations and who receive or deliver by telephone communications pertaining to or affecting the movement of trains.

The defendant company in this proceeding sued out a writ of error to the court of appeals for the sixth circuit; but while the case was there pending it reappeared in the district court, confessed judgment, and paid the penalty prescribed.

In the case of United States *v.* Denver & Rio Grande Railroad Co. (197 Fed., 629) the District Court for the District of New Mexico held that the crew of a train detained on a siding to allow another train to pass is, during the interval of waiting, "on duty" within the meaning of the act, if the time at which the latter train will pass is indeterminate, and if the former train is required to resume its journey immediately after the passing of such train.

In the case of United States *v.* Galveston, Harrisburg & San Antonio Railway Co., not officially reported, the District Court for the Western District of Texas instructed the jury, in effect, that a broken drawhead, fractures of rails due to insufficient weight, and the occasional stoppage of trains for the purpose of allowing other trains to pass, are usual and ordinary incidents in the operation of a railroad system and are not to be regarded as excuses for service in excess of that prescribed by the hours of service act.

On November 17, 1911, the Court of Appeals of Kentucky, in St. Louis, Iron Mountain & Southern Railroad Co. *v.* McWhirter (140 S. W. Rep., 672), unanimously decided that where a flagman was killed in the course of duty after having been on duty more than 16 consecutive hours the continuance of his service beyond the statutory period constituted negligence per se on the part of the railroad and was the proximate cause of his death, for which the company was liable.

In the case of United States *v.* Chicago, Milwaukee & Puget Sound Railway Co., not officially reported, the District Court of the United States for the Eastern District of Washington (citing United States *v.* Atchison, Topeka & Santa Fe Railway Co., 220 U. S., 37), held that an aggregate period of 2 hours and 45 minutes, allowed for meals, or even an interim of 3 hours during which the crew involved was waiting at a siding for a helper engine, the latter period of respite being indefinite, did not break the continuity of service and should therefore be included in determining the total time on duty.

In a recent case against the Missouri, Kansas & Texas Railway Co., decided by the District Court of the United States for the Eastern District of Texas, the jury was instructed that certain enumerated delays which are to be encountered in the usual operation of trains, such as stopping for water, repairing mechanical defects, meeting trains, losing time by reason of a frosty track, etc., do not fall within the proviso relieving carriers from liability under the hours of service act.

The case of the United States *v.* Chicago, Milwaukee & Puget Sound Railway Co. (195 Fed., 783) is important as being the first adjudication in a suit involving the prosecution of a carrier for its failure to file with the Interstate Commerce Commission monthly reports of excess service under the hours of service act. The decision in that case, being favorable to the Government, sustains the contention of the Commission and affords a precedent for the future guidance of the carriers subject to the law.

INVESTIGATION OF ACCIDENTS.

The work of investigating accidents under the law of May 6, 1910, has developed valuable information respecting the causes of railroad accidents, and has proceeded far enough to indicate the need of more effective measures than have thus far been taken to secure safety of railroad travel.

In its last annual report the Commission recommended legislation requiring the adoption of steel cars and the use of the block system, as well as standardization of the operating rules of all interstate carriers. It also noted the necessity of ascertaining and improving the physical condition of tracks and roadways. Up to September 1, 1912, 81 accidents had been investigated, 49 of which were collisions and 31 derailments, the other one being a grade-crossing accident. These investigations have confirmed the superiority of the steel car from the standpoint of safety. It may be noted, however, that the railroads generally are replacing their older cars with modern cars of all-steel or steel-underframe construction as rapidly as conditions will permit, and as a result the danger from the use of unsound cars is gradually disappearing.

Knowledge gained from accidents that have been investigated indicates beyond question that with the track and roadway conditions existing upon many railroads in this country the danger of serious derailments is ever present. Of the 31 derailments investigated, 14 were either directly or indirectly caused by bad track. In 5 of these 14 cases the derailments would probably have been avoided had existing speed restrictions been observed; but in all the remaining cases no adequate speed restrictions were in force, and in 3 cases the track conditions were so obviously unsafe that derailments were likely to occur even at low speed. In one serious derailment an

examination of the track in the vicinity of the accident disclosed 906 rotten ties within a distance of 147 rail lengths. Under many of the rails there were as many as 11 bad ties, and under each of 2 rails there were 12 ties so badly decayed and broken as to be totally unfit for service. In many of these ties the spikes were so loose that they were easily removed by hand, the wood having no longer any holding power. The track in the vicinity of this accident was poorly ballasted and was unsafe for the passage of trains at ordinary speed. This derailment occurred on straight track while the train was running about 30 miles per hour.

This, of course, was an extreme case, and it can not be taken as representative of a general condition; but bad track has so often been encountered in these investigations as to lead to the conclusion that it is more common than it should be, and to indicate the necessity of more efficient supervision of track and roadway. It is believed that lack of men and material are responsible for bad track conditions on many roads.

With the facilities at its command it is manifestly impossible for the Commission to investigate more than a comparatively small proportion of the accidents that occur. Only those which result in loss of life are reported by wire, and even those which are so reported can not all be investigated, owing to the limited number of men available for such work. At present the Commission obtains no knowledge respecting the physical condition of track and roadway except as the result of an investigation following an accident.

In its investigations of accidents involving broken rails the Commission has received valuable aid from the Bureau of Standards of the Department of Commerce and Labor. This bureau has facilities for determining the qualities of rails, and its engineer-physicist, Mr. James E. Howard, is especially well equipped by training and experience to determine with accuracy the causes of rail failures. In six accidents of this character Mr. Howard has made exhaustive examinations and tests of the rails involved, and his reports show that current specifications for the manufacture and testing of rails are inadequate to disclose the most common cause of failures. Mr. Howard also points out that "the line of demarcation between safe and unsafe conditions has not been demonstrated in practical railway engineering," and "it is not known how much or how little margin of strength resides in the track." Comparatively little engineering information is available pertaining to the structural value of the material used and the stresses set up in railroad track under modern operating conditions. There is urgent need of accurate information on this point.

The most disquieting and perplexing feature in the problem of accident prevention is the large proportion of train accidents caused by dereliction of duty by the employees involved. By far the great-

est number of our serious train accidents are due to the failure of some responsible employee to perform an essential duty at a critical time. The seriousness of this problem is indicated by the fact that of the 81 accidents investigated up to September 1, 52, or more than 63 per cent of the whole number, were caused by mistakes on the part of employees. These 52 accidents comprise 48 of the 49 collisions investigated, and 4 of the 31 derailments. They caused the death of 248 persons and the injury of 1,309 persons. Of the 48 collisions caused by errors of employees 33 occurred on roads operated under the train-order system and 15 occurred under the block system.

The most numerous failures were by trainmen or enginemen. These were disobedience of orders; disobedience of signals; failure to keep clear of superior trains; improper flagging; and failure to control speed at dangerous points. Such lapses were responsible for 41 of the accidents investigated. Errors of train dispatchers or telegraph operators in transmitting, copying, or delivering orders were responsible for 6 accidents, and errors of block-signal operators or towermen in giving improper signals were responsible for 4 accidents. These are the identical errors that have always caused train accidents. They are bound to occur with more or less frequency, and can not fail to result in accidents whenever absolute reliance for the safe movement of trains is placed upon human beings, and employees are depended upon to do exactly the right things at all times and under all circumstances.

There is a disposition in some quarters to charge these lamentable errors to failure of discipline and to hold employees wholly responsible for such failure. This is a superficial view which contains no promise of effective remedy. It can not be assumed that employees deliberately ignore disciplinary measures which they know from experience are necessary for their own safety as well as for the safety of many others who for the time being are placed in their charge; nor is it conceivable that rules which have been enacted to secure safety in the movement of trains are disregarded by employees, knowing that the result may mean their own death, except under pressure of some compelling motive that for the moment overcomes the force of the regulations.

The Commission believes that as a rule there are no men that have a keener appreciation of their responsibilities than railroad trainmen and enginemen. To take the safe side in case of doubt is a fundamental principle of train operation, a rule that is drilled into them from the very moment they begin service, until it becomes a part of their lives, a constant admonition to caution. From the time a trainman begins service he is drilled to regard the sacredness of a train order, the importance of a strict observance of signals and rules, the great need of caution, and the absolute necessity of keeping his wits about him and never forgetting a meeting point nor the slightest detail of an

order. He lives constantly in an atmosphere of caution, of admonition. The necessities of his vocation, the responsibilities connected with it, become a part of his life. This training can not fail to develop men of keen and retentive memory; men who have a minute regard for detail, and who are likely to pay strict attention to orders and signals.

A remarkable increase in the speed and weight of trains within recent years, and the crowding of tracks and terminals caused by the movement of an enormously enlarged volume of traffic, have greatly increased the duties and responsibilities of train-service employees and multiplied the chances of error on their part. Notwithstanding these added duties and responsibilities which the conditions of modern railroading have imposed upon employees, the methods of discipline and regulations calculated to insure safety in train operation have remained practically unchanged. Rules which a few years ago were perhaps reasonable and proper remain in force, although it is well known that they are no longer consistent with the demands of traffic, and it too often happens that these obsolescent rules, which place entire responsibility for safety upon employees who are already overburdened, are the only measures relied upon to avert possible disaster.

To prevent railroad collisions adequate measures must be taken, first, to reduce the chances of human error to a minimum, and, second, to neutralize the effects of such error when it occurs. The recommendations previously made by the Commission for legislation requiring the standardization of operating rules and the use of the block system were designed to reduce the probability of mistakes by employees, and those recommendations are once more presented for consideration of the Congress. Uniformity and consistency in operating rules are necessary to secure safety, and it is not probable that a satisfactory code which will meet the demands of modern operating conditions can be secured without appropriate action by the Federal Government. In formulating such a code of rules the prevention of accidents must be paramount to all other considerations, and once agreed upon and adopted they should be rigidly enforced. This is an important fundamental reform that can be put in force with inconsiderable financial outlay by the railroads, and if undertaken in a spirit of cooperation and helpfulness by the railroads and the public and the employees concerned it can not fail to produce results that will greatly reduce the number of these harrowing railroad disasters.

The adoption of the block system is another thing that should be required. The block system by no means insures immunity from collisions. On the contrary, the most serious collisions that have occurred in this country were on block-signaled roads. From the standpoint of safety the block system is superior to the train-order system only because it presents fewer opportunities for men to make

mistakes. Its adoption, therefore, would reduce the chances of human error, and when used in connection with a code of operating rules such as is herein suggested, together with the necessary reformation of operating methods and disciplinary measures which must follow, it would greatly increase the safety of railroad travel.

The problem of the introduction of means to neutralize the effects of human error is one for which no specific solution can be offered. It involves considerations and details pertaining to purely local circumstances and conditions of operation which each railroad must settle for itself. It is probable that in many places the use of some form of an automatic stop device might properly be regarded as necessary to the safe operation of trains.

Excessive speed, necessary to maintain the schedules of fast trains, has been an important factor in many train accidents. The conditions of safe operation are often ignored in the effort to bring these fast trains in on time. In connection with some of the fast excess-fare trains a premium is placed on speed to the extent of returning to passengers a portion of the fare charged whenever schedules are not maintained. This is a bad practice, for which the traveling public is largely responsible, and it should be discontinued. The incentive should be to maintain safety rather than speed, and adequate measures should be taken to compel low speed wherever conditions require it whether schedules are maintained or not.

Great possibilities in the direction of a solution of the problem of accident prevention lie in the so-called safety committees which have been organized on many roads. These committees are composed of officers and employees who cooperate in striving to eliminate accidents due to failure of men properly to perform their duties. By making "safety first" the dominant idea in the minds of employees, and continually pointing out methods for its attainment, an important step in the right direction is taken.

INSPECTION OF LOCOMOTIVE BOILERS.

Under the boiler-inspection act of February 17, 1911, which became effective July 1, 1911, an organization has been effected which is supervising the inspection and testing of approximately 63,000 locomotives which are subject thereto. The territory comprising the several States and Territories and the District of Columbia has been divided into 50 locomotive boiler inspection districts, so arranged that the service of the inspectors is most effective and the work required of each inspector substantially the same. In making this division of territory it was necessary to consider, in addition to the number of locomotives in each district, the density of traffic, the number and location of inspection and repair points, the facilities for making repairs, the amount of travel necessary to properly cover the district, and the most advantageous location for the office of the

inspector. The inspectors, who were appointed through the examination conducted under the auspices of the Civil Service Commission, came from the several branches of locomotive service. They are all skilled in the various branches of mechanics necessary for the inspection, maintenance, and operation of locomotives, as well as being particularly qualified to investigate accidents resulting from failure from any cause of a locomotive boiler or its appurtenances.

Among the more important requirements of the rules and regulations approved by the Commission governing the inspection of locomotive boilers are the following: The filing of specification cards for all locomotive boilers subject to the act, which shall give their description and general design, and the inspection and testing of all boilers at regular and proper intervals.

The specification card is required to be filed in the office of the chief inspector and embodies, in connection with the general design of the boiler, the principal dimensions, material, and thickness of the boiler sheets, description and measurement of seams, the tensile strength of the various parts as shown by tests to which the material was originally subjected, the result of the calculations of the stresses to which the principal parts are subjected and from which the factor of safety and the proper working pressure can be computed.

From the data thus obtained it is possible at all times to determine the strength of any boiler in service and to fix the safe working pressure. The information thus collected forms a permanent record, and as new locomotives are constructed or the specifications for locomotives which are on file are altered in any manner, proper check and notation is made thereof.

The calculations given on these specifications are being carefully checked and those which contain errors are returned to the railroad company for correction before being filed. The importance of this checking is demonstrated by the fact that serious errors have been found in about 6,000 specification cards out of a total of 34,000 filed.

Section 6 of the law provides—

> that each carrier subject to the act shall file with the inspector in charge under the oath of the proper officer or employee a duplicate of the report of each inspection required by such rules and regulations, and shall also file with such inspector under the oath of the proper officer or employee a report showing the repair of the defects disclosed by the inspection.

In accordance with this provision the rules require inspections of various parts of the boiler to be made at certain prescribed intervals and reports properly certified to filed with the district inspector. In order to reduce to a minimum the number of reports required a combination report showing the defects disclosed by the inspection and the repairs made was adopted. This report shows the date the safety valves were set and the pressure; the date on which steam gauges have been tested; that the boiler has been washed and gauge cocks and

water-glass cocks properly cleaned and repaired; that injectors were tested and left in good condition; all steam leaks repaired; the condition of flues, firebox sheets, stay bolts, and crown stays; the number of stay bolts and crown stays renewed; and the date of the previous hydrostatic test. These reports, together with the information which the inspectors obtain during their regular inspections, enable them to keep in close touch with the general condition of equipment and have repairs made when necessary.

A copy of this report or a special quarterly card showing that inspections had been made in accordance with the rules and that the locomotive is in a safe and proper condition to operate must be displayed in the cab of the locomotive.

Before being put into service and at least once every 12 months thereafter, every boiler must be subjected to hydrostatic pressure 25 per cent above the working steam pressure, thoroughly inspected, and a special report of the defects found and repairs made must be filed with the district inspectors.

In addition to the above-mentioned requirements special tests and inspections of all boiler appurtenances are required, and it is made the duty of the railroad company to know that all locomotives are in a safe and proper condition to operate before they allow them to be used. This places the burden of the inspection and the responsibility for the condition of all locomotives on the carriers, which was the manifest intent of the law.

When making regular inspections of equipment, district inspectors are instructed to report all defects which exist. This practice has been objected to in numerous instances by representatives of the railroads on the ground that certain defects which had been reported did not constitute violations of the law. These objections were given consideration, but investigation usually disclosed the fact that they originated at points where defective conditions existed and were due to a desire on the part of local officials to avoid censure for permitting such conditions. While the work of the district inspectors might be materially reduced by not reporting defects until they became violations, as some railroads seem to desire, and then take action as provided in section 9 of the law, the present practice of reporting and insisting on the prompt repair of all defects before they become serious has been so productive of good results that it will be vigorously continued, as we believe the purpose of the law can be best served by endeavoring to prevent violations rather than by waiting until violations occur and then filing suits to enforce the penalty. However, this should not be construed as meaning that suits will not be filed if necessary to enforce the provisions of the law or the lawful orders of any district inspector.

The investigation of accidents as provided by section 8 of the law has occupied a great deal of the time of the district inspectors and is

one of the most important of their duties. Two hundred and fifty-five accidents have been investigated during the year and in each case the necessary action has been taken to avoid if possible a recurrence of similar accidents.

In the more serious accidents the investigation has been conducted wherever possible by the chief or one of the assistant chief inspectors. The data obtained from the specification cards and from the monthly and annual reports are always available for use in making accident investigations, and when additional information can be obtained by so doing tests are made of the boiler material to ascertain whether it conforms to the required standard.

Inasmuch as it is of the utmost importance that all accident investigations be conducted promptly, the headquarters of one of the assistant chief inspectors were established at Denver, Colo., where he could keep in close touch with this work in the western territory and have all investigations conducted without unnecessary delay to equipment. This has also resulted in materially reducing the traveling expenses necessary to the proper supervision of the work in that territory.

Locating the offices of the district inspectors in Federal buildings wherever proper space could be obtained has also resulted in a substantial reduction in expenses, 35 of the district offices now being so located. One inspector is located in the office of the chief inspector at Washington and two in the office of the assistant chief inspector at Denver. It has therefore been necessary to rent office space at only eight points, as in several instances it has been practicable to have two district inspectors occupy the same office.

During the year 74,234 locomotives were inspected, 48,768 of which were found defective; 3,377 locomotives were ordered out of service for repairs.

In addition to this, the following locomotives were required to be strengthened or changed to comply with the requirements of the law or permanently removed from service:

Number having pressure reduced to insure a proper factor of safety	699
Number having seams reenforced by welt plates to insure a proper factor of safety	327
Number permanently removed from service on account of defective condition	698
Number having the lowest reading of water glass ordered raised to comply with the law	992
Number having lowest gauge cock ordered raised to comply with the law	408
Number ordered strengthened by having braces of greater sectional area applied	351
Number requiring additional support for crown sheet	116

It will thus be seen that a total of 6,968 locomotives were either held out of service for repairs or changed and strengthened to conform to the requirements of the law or permanently removed from service.

This work has been accomplished without the necessity of resorting to the courts in a single instance to enforce the requirements of the law or the lawful orders of the district inspectors. Of the 3,377 locomotives which have been ordered out of service only 5 cases have been appealed to the chief inspector, in 3 of which the orders of the district inspectors were sustained and 2 reversed.

In this connection it is but fair to state that in the efforts of the chief inspector of locomotive boilers to carry out the provisions of the law he has had the cooperation of the railroad officials on practically all roads. Wherever he has met with opposition it has usually been found due to a lack of a proper organization or equipment to properly perform the work as required. A marked improvement in this condition of affairs is, however, already manifest, and the necessary action is being taken to bring about a proper observance of the law in all cases.

RECOMMENDATIONS.

In previous reports the Commission has called the attention of Congress to the desirability of legislation upon various subjects; among others, a physical valuation of railroads, a uniform classification, a more explicit definition of the authority of this Commission over telegraph and telephone lines, and control over railway capitalization. We here renew our previous recommendations without taking time to restate the reasons already given.

The Commission has also found, in the course of its work, several situations in which it was unable to administer such relief as justice to all parties called for, owing to its limited powers. These defects, however, are not vital to the execution of the act; and while they probably must at some future time be dealt with by Congress, it has seemed best to await the result of further experience before proposing any definite amendments on this account.

The increase in casualties to railroad employees during the past year, and the numerous fatal accidents to passengers which have occurred in recent months, provoke the inquiry whether additional legislation may not be directed toward safety of railway operation. The Commission is giving this matter careful attention, but is not prepared at this time to make a definite recommendation.

All of which is respectfully submitted.

Charles A. Prouty.
Judson C. Clements.
Franklin K. Lane.
Edgar E. Clark.
James S. Harlan.
Charles C. McChord.
Balthasar H. Meyer.

76397°—Ab. 1912—vol 2——61

INDEX.

Page.

Abandoned military reservation 1146
Abbey Dodge, abstract of decision of 826
Accidents, investigation of railway 1795
Accounts and Disbursements, Division of, Agriculture, Department of 1344
Adams Act 1470
Adjutant General, War Department, report of 331
Adjutant General's Department 321, 353
Administrative boards, Department of Agriculture 1501
Agricultural colleges and schools 1359
Agricultural credits 14, 57, 1285, 1287, 1288
Agricultural education 1472
Agricultural products, foreign trade in 1280
Agricultural statistics 1449
Agriculture, Alaska 1105
Agriculture, Department of:
  Accounts and Disbursements, Division of 1344
  Administrative bonds—
    Federal Horticultural Board 1504
    Food and Drug Inspection, Board of 1502
    Insecticide and Fungicide Board 1503
    Referee Board 1501
  Animal Industry, Bureau of 1300
    Animal diseases, eradication of 1303
    Animal diseases, investigation of 1305
    Butter, stored 1416
    Cattle breeding, experiments in 1302
    Dairy farming 1306
    Dairy manufacturers 1307
    Dairy research laboratories 1308
    Experimental farms 1431
    Inspection and quarantine of imported animals 1418
    Horse breeding, experiments in 1301
    Meat inspection, by 1300
    Milk, investigations of market 1307, 1415
    Ocean vessels, inspection of 1426
    Poultry and egg investigation of 1302
    Sheep and goats, experiments in breeding of 1312
    Vaccine, distribution of 1305
    Work of 1412
  Biological Survey, Bureau of, work of 1338, 1431
  Brief comments on 1267
  Chemistry, Bureau of—
    Dairy products, investigation of 1311
    Distillation of wood, products obtained by the destruction 1458
    Drug investigation 1312
    Food and drugs, inspection of 1313
    Foods, canning of 1310
    Fruit products, studies on 1310
    Insecticides and fungicides, investigation of 1314, 1456
    Paper and leather making materials 1451
    Plant physiological chemistry 1312
    Poultry and egg investigations of 1308
    Sugar and sugar products, investigation of 1311
    Waters, mineral and table, investigation of 1313
    Work of 1454

Agriculture, Department of—Continued.
Page.
Entomology, Bureau of—
Cooperation with other agencies ... 1407
Demonstration work ... 1407
Forest insects, work against ... 1334
Growth of service ... 1402
Importations of injurious insects ... 1403
Insects affecting health of man, work on ... 1336
Insects as carriers of diseases ... 1406
Insects injurious to trees ... 1406
Inspection work of ... 1335
Other noxious insects ... 1405
Work of ... 1333
Expansion of ... 1372
Experiment Stations, Office of—
Adams Act ... 1470
Agricultural experiment stations, relations with ... 1353
Alaska stations ... 1361, 1476
Drainage investigations of ... 1366, 1484
Guam station ... 1364, 1478
Hawaii station ... 1362, 1477
Insular stations ... 1360, 1476
Irrigation investigations ... 1364, 1482
Nutrition investigations of ... 1367, 1479
Porto Rico station ... 1363, 1477
Publications of ... 1475
Statistics ... 1473
Work of ... 1469
Library of ... 1353, 1486
Personnel ... 1289
Plant Industry, Bureau of—
Arlington farm and horticultural investigations ... 1388
Beet-sugar industry, development of ... 1393
Cotton work, progress in ... 1384
Crops resistant to alkali and dry-land conditions ... 1383
Demonstration work, progress in ... 1399
Drug plants, work on ... 1397
Dry-land agriculture, investigations of ... 1382
Explorations under way ... 1378
Farm management, field studies and demonstrations of ... 1401
Farm-management investigations ... 1400
Forage crops, special work on, by ... 1379
Grain standardization ... 1392
Grains and other crops for semiarid lands ... 1376
Irrigation and dry-land farmer, aiding the ... 1380
New fruits and other crops introduced by ... 1377
Outline of policy ... 1375
Plant physiological investigations ... 1398
Plant physiology and pathology, progress in ... 1394
Poisonous-plant studies ... 1398
Pomology, progress in ... 1390
Rice farmers, aiding ... 1376
Seed distribution of ... 1391
Soil-bacteriology and plant-nutrition investigations ... 1397
Tobacco investigations, result of, of ... 1381
Work of, for 1912 ... 1308
Public Roads, Office of (*see also* Public Roads), work of ... 1368, 1465
Publications, Division of—
Copies distributed ... 1374
Evidence of growth and usefulness ... 1373
Farmers' bulletins, demand for ... 1346
Sale of department publications by Superintendent of Documents ... 1346
Work of ... 1345
Record of 16 years' service ... 1372
Secretary of, report of ... 1267
Soils, Bureau of, work of ... 1329

Agriculture, Department of—Continued. Page.
Solicitor, Office of 1290
Diseases of live stock, suppression of contagious 1507
Food and drugs act 1290, 1510
Forest Service, work for the 1291
Illegal claims to lands in the national forests 1514
Insecticide and fungicide act 1292, 1511
Lacey Act 1293, 1508
Legal business for the Forest Service 1515
Live-stock quarantine acts 1292
Meat inspection 1292, 1510
Plant quarantine act 1512
Publications of 1293
Trespasses on national forests 1512
Twenty-eight-hour law 1292, 1509
Weeks forestry law 1515
Work of 1506
Statement of President concerning 56
Statistics, Bureau of—
Agricultural economics 1453
Work of 1348, 1449
Survey of local condition 1283
Weather Bureau, work of 1294
Work of, in 1912 1289
Agriculture, Secretary of, ex officio, functions of the 1505
Alamo attachment, Army 435
Alaska:
Agriculture 1105
Aids to navigation 1107
Assessed valuation and taxes 1103
Coal-land investigations by General Land Office 1134
Coal leases 1106
Commerce 1103
Education, recommendation of Commissioner of 1199
Fisheries and fur resources of 1104, 1611
Game protection in 1343
Governor's office 1108
Health of troops in 483
Mines and mining 1103
Native inhabitants 1106
Placer mining claims in 1151
Public buildings in 1107
Reindeer service 1196
Report of the Secretary of the Interior on 1102
Road work 261
Roads and trails 1107
School service 1194
Surveys in 1139
Territorial legislature 1107
Transportation and coal development in 1040
Alcohol, denatured, investigation of, Department of Agriculture 1459
Alcoholism in the United States 477
Aldrich-Vreeland law 66
Alfalfa weevil 1334
Alien contract lakorers, exclusion of 1569
Aliens:
Ages and periods of residence of departing 1568
Arrests and deportations of 1569
Rejection of arriving aliens 1568
Allotments to Indians 1257
Altman & Co. *v.* United States, abstract of decision of 832
Ammunition for cannon, in Army 554
Animal diseases:
Bovine tuberculosis 1424
Cattle mange 1423
Cattle tick 1425
Eradication of 1303

	Page.
Animal diseases—Continued.	
Exclusion of	1419
Foot-and-mouth disease	1421
Glanders and other diseases	1427
Hog cholera	1304
Investigation of other	1305
Remedies, scientific	1429
Scientific investigation of	1425
Sheep scab	1422
Stamping out, by Department of Agriculture	1420
Texas fever	1421
Tuberculosis	1303
Animal Industry, Bureau of, work of	1300
Animal products, value of all	1277
Anophelenæ and stegomyia, experiments to test the fineness of mesh necessary in bronze netting to prevent the passage of	501
Anthracite-coal combine, status of case against	773
Antiquities, American, preservation of	1113
Antitrust law:	
Criminal indictments found under	777
Criminal prosecutions under	771
Dissolution decrees obtained under	767
New proceedings started under	775
Prosecutions under	765
Antitrust suits, taking testimony in	778
Appropriations, estimates of, submitted by Secretary of the Treasury	98
Arkansas, sunk and lake lands in	1144
Arlington experimental farm	1388
Armament and equipment	373
Armament of fortifications, maintenance of	558
Army:	
Actual strength and distribution	235, 332
Additional officers	320, 339
Authorized strength	235, 331
Beriberi	238
Canteen	330
Cavalry	307
Change in uniform	330
Changes of stations of troops	335
Clothing	372, 391
Coast Artillery	312
Comparison of authorized and actual strength	333
Concentration of posts	246
Consolidation of supply departments in Philippines	436
Cost of	288
Deaths	461
Decentralization	329
Desertions	323, 345, 381
Desertions and enlistments	237
Detached service	293
Detached service restricted	249
Discharges for disability	443, 455, 457
Discharges by purchase	352
Discharges on surgeon's certificate of disability	351
Discipline in	372
Disease, admission rates for	443
Disease, noneffective rates for	443
Enlisted men	441
Enlisted men, discharge of, ordered by War Department	351
Enlistments and desertions	237
Field Artillery	308
Foreign garrisons, reorganization of the	243
General Service Corps of	249
Geographical distribution of troops	334
Geographical divisions and departments	334
Health and sanitation of	237, 439
Infantry	313
Inspector General's Department	324

Army—Continued. Page.
Instruction 372
Legislation 292
Losses of 344
Maneuvers in 321
Medical Department 327
Military operations of, in Mindanao 240
Military operations of, on Mexican frontier 240
Nonmilitary duty and poor administrative methods 314
Officers, new 236
Ordnance Department 326
Organization of 241
Paper work of 247
Pay bill, the, of the National Guard 250
Pay Department 327
Personnel of 236
Philippine Scouts 334
Philippines, troops sent to 337
Plan of reorganization 242
Posts, concentration of 246
Quartermaster's Department 325
Recruiting for 321, 354, 447
Regular reserve 37
Reorganization at home 245
Reorganization of foreign garrisons 243
Reorganization, plan of 242
Reorganization of, statement of the President concerning 35
Reserve 296
Reserve material 299
Reserve supply of Field Artillery guns and ammunition 254
Reserves 246
Retired enlisted men 343
Roster of, and enlisted men of Union and Confederate Armies 367
Sanitation in United States 481
Sanitation of posts 374
Second lieutenants appointed 338
Service of troops 331
Service schools 320
Signal Corps 328
Strength of 287, 344
Subsistence Department 326
Supplies 389
Tactical organization of, and its redistribution 305
Transportation 374, 414
Troops, enforcing neutrality laws on Mexican border 362
Typhoid prophylaxis 237
Venereal diseases in 238
Volunteers 300
Army legislation 248
Army Medical School 525
Army Medical School laboratory 519
Army officers:
Commissioned, in active service 339
Commissioned, who had Civil War service 342
Detached service, on 340
Examined for promotion 341
Retired 341
Retired, on active duty 340
Army powder factory 557
Army Signal School 623
Army War College 285
Arneth's nuclear classification 502
Artificial limbs and apparatus, Army 531
Ash-pan act, cases under 783, 1792
Assay offices 216
Assay offices, recommendations of Secretary of the Treasury relative to 71
Atchison, Topeka & Santa Fe Railway Co. *v.* United States, abstract of decision of 844

Page.
Attorney General:
Assistant, office of, in the Interior Department 1060
Opinions of 810
Report of the 763
Augusta Arsenal 570
Automatic machine rifles in Army 555
Aviation:
Army, present and future of 632, 636
Navy 873, 937
Uses of, contemplated in naval warfare 937
Badges, campaign 368
Bakers and cooks, Army, training school for 434
Balloons, Army 631
Banking:
Growth of, in recent years 173
Growth of, in United States 170
Banking power of the United States 174
Banking and currency reform 63
Banking and currency system of the United States 31
Banks: (See also National banks.)
Classification of loans and discounts in all 174
Condition of, in United States 166
Condition of, other than national banks, in United States 166
Individual deposits in all, in United States 177
Investments of all, in bonds and other securities 175
Liabilities of all reporting 169
Money in 176
Principal items of resources and liabilities from 1863 to 1912 171
Resources of all reporting 167
Savings deposits in all 179
Summaries of reports from State, savings, private banks, and loan and trust companies 181
Barley crop 1273
Barometry, thermometry, and cloud observations 1446
Barracks and quarters, home port 653
Beef, savings on, in the western division 429
Beet-sugar industry, development of 1393
Benicia Arsenal 570
Beriberi 491
Biological Survey, Bureau of, work of 1338, 1431
Bird reservations 1149
Birds, food habits of 1433
Birds, importations of 1340, 1431
Birds, species injurious to agriculture 1433
Birds, the economic relations of, to farming 1339
Blackleg vaccine 1425
Blind, Maryland School for the 1121
Blondes, the relative resistance of, and brunettes to the harmful influence of a tropical climate 494
Blood pressure and pulse rate in the Tropics 495
Board of General Appraisers, investigation of 68
Bonded debt of the United States 149
Bonded indebtedness of Philippines 662
Bonds of the United States:
Business conducted by Register of Treasury with regard to bonds of United States 202
Coupons 207
Held as security for national banks 109
Held as security for postal-savings funds 110
Payment of interest on registered 105
Withdrawal of, to secure circulation 111
Bounty-land claims, Pension Office 1096
Bounty-land warrants 1178
Bovine tuberculosis 1424
Brown *v.* Elliott et al., abstract of decision of 832
Brown-tail moth 1333

Page.
Brunettes, the relative resistance of blondes and, to the harmful influence of a tropical climate ... 494
Bryan, collector of the port of Charleston, *v.* Ker, executrix, abstract of, decision of ... 825
Bucket-shop cases ... 805
Buckwheat crop ... 1274
Budget ... 66
Budget, prepared for the President by the Economy and Efficiency Commission ... 49
Bulkley resolution ... 34
Business conditions of the country ... 304
Cabinet officers, seats on floor of Congress for ... 29
Cable ships ... 49
California Débris Commission ... 625
California oil lands ... 604
California school-land grant, adjustment of ... 1135
Campbell *v.* United States, abstract of decision of ... 1143
Camps of instruction, joint ... 831
Canal Zone: ... 360
  Civil administration ... 754
  Department of law ... 757
  Department of sanitation ... 759
  Employees, recreation of, in ... 760
  Municipal improvements in Colon and Panama ... 737
  Quartermaster's department of ... 747
  Subsistence department of ... 750
Canteen in Army ... 330
Capitol, United States, report of Superintendent of ... 1121
Carey Act ... 1140
Carey Act, applications filed under ... 1064
Cattle breeding, experiments in ... 1302
Cattle foods and grains, investigation of ... 1315
Cattle mange ... 1423
Cattle tick ... 1425
Cavalry ... 307
Cavalry in parks ... 308
Ceded Indian lands, use of ... 1250
Cement testing by Bureau of Standards ... 1599
Census Bureau: ...
  Appropriations for ... 1562
  Decennial Census, general progress of ... 1557
  Expenditures of ... 1562
  Financial statement of the Thirteenth Decennial Census to June 30, 1912 ... 1562
  Legislation, new, relating to ... 1558
  Office force ... 1559
  Personnel of ... 1543
  Plans for fiscal year 1913 ... 1558
  Tabulating machines ... 1565
Census frauds prosecutions ... 793
Central America, need of help in debt adjustment ... 11
Central America, visit of Secretary Knox to ... 13
Central American Republics, our relations with ... 25
Central power plant for Government buildings ... 72
Cereals, all ... 1275
Cerebrospinal meningitis in Army ... 476
Chamizal dispute ... 19
Cherokee Nation and United States *v.* Whitmire, abstract of decisions of ... 844
Chief of Engineers, Army, report of ... 577
Chief of Ordnance, Army, report of ... 534
Chief of Staff, report of ... 285
Children's Bureau ... 1581
China, relations with ... 10
Chinese immigration ... 1570
Chippewa lands, opening to homestead entry ... 1147
Chippewa logging, Minnesota ... 1065
Civilian assistants to engineer officers ... 597
Civil officers in insular possessions ... 674

Page.
Civil pension system, Secretary of the Treasury relative to 79
Civil Service Commission (*see also* Classified service):
Cost of 1743
Examinations and appointments 1716
Examinations with unusual requirements 1717
Official register and service records of 1738
Report of 1713
Civil-service commissions in other countries 1743
Civil service in Philippines and Porto Rico 1740
Civil-service retirement 262
Claims arbitration with Great Britain 17
Clairmont *v.* United States, abstract of decision of 834
Classification of postmasters under the civil service 53
Classified service:
Apportionment 1721
Attempts by employees in, to influence legislation 1727
District of Columbia employees 1738
District system 1729
Extent of 1714
Growth of 1715
Increased efficiency in, due to merit system 1735
Manner of making appointments in Rural Delivery Service 1719
Political activity of officeholders and political assessments 1730
Popular approval of the merit system 1742
Proposed extension of 1736
Reclassification of salaries in, on basis of work performed 1736
Removals in 1725
Temporary appointments in 1720
Clearing-house transactions 183
Coal development in Alaska 1040
Coal-dust explosions, investigation of, by the Bureau of Mines 1217
Coal-dust, inflammability of 1223
Coal-land classifications and valuations 1125
Coal-land entries, number of 1159
Coal-land leases 1036
Coal lands reserved for the Navy 879
Coal leases, Alaska 1106
Coal-roads combination, status of case against 774
Coal stations, Navy, closing of 889
Coast and Geodetic Survey:
Assistance rendered by, in saving life and property 1638
Chart production 1637
Geodetic work 1629
Hydrographic work of 1632
International boundaries surveyed by 1636
Magnetic work done by 1631
Outlying territory, work done in 1635
Tidal and current work of 1635
Topographic work of 1632
Coast Artillery, armories, Organized Militia, equipment of 600
Coast Artillery Board 645
Coast Artillery Corps:
Chief, report of 637
Enlisted specialists in 640
Examination of officers for promotion 644
Instruction and target practice 641
Matériel 313
Personnel 312, 637
Preliminary course of instruction for officers appointed to the 644
Reserves 643
Strength of 637
Supports 644
Coast Artillery practice 556
Coast forts, electrical installations at 657
Coffee valorization 775

Page.
Coins:
Minor ... 127
New nickel ... 79
Standard silver dollars ... 126
Subsidiary silver ... 127
Colorado River Commission, establishment of ... 18
Colorado River, lower, work along ... 1058
Colored teas ... 80
Columbia Institution for the Deaf ... 1120
Commerce and Labor, Department of:
Activities of ... 1520
Appointment Division, work of ... 1541
Appropriations for, table showing ... 1533
Census, Bureau of. (*See* Census Bureau.)
Chief clerk of, office of, work of ... 1529
Children's Bureau ... 1581
Coast and Geodetic Survey, report of (*see* Coast and Geodetic Survey) ... 1629
Constructive legislation relating to, enacted ... 1521
Corporations, Bureau of. (*See* Corporations, Bureau of.)
Cost of operation and maintenance of ... 1519
Disbursements of, all bureaus, table showing ... 1534
Disbursing Office, work of ... 1533
Employees—
Efficiency of ... 1545
In general ... 1520, 1531
Law of apportionment with regard to ... 1547
Temporary appointments ... 1545
Promotions ... 1545
Superannuation and retirement of ... 1546
Fisheries, Bureau of, work of, in general ... 1602
Foreign and Domestic Commerce, Bureau of, organization of ... 1522
General condition of ... 1523
Immigration and Naturalization, Bureau of, report of ... 1567
Immigration Service. (*See* Immigration Service.)
Investigation of seal herds by ... 1526
Labor, Bureau of. (*See* Labor, Bureau of.)
Labor-saving machinery introduced in ... 1529
Lighthouses, Bureau of, report of ... 1618
Lighthouses, Bureau of, law authorizing organization of ... 1521
Lighthouse Service. (*See* Lighthouse Service.)
Manufactures, Bureau of, work of ... 1581
Manufactures, Bureau of. (*See* Manufactures, Bureau of.)
Navigation, Bureau of, report of ... 1638
New building for ... 1529
Positions in department, table showing ... 1541
Printing and publications of ... 1549
Publications, distribution of ... 1551
Publications, Division of, work of ... 1549
Publications, sale of ... 1555
Publication work ... 1551
Purchase of supplies for ... 1530
Receipts of ... 1520
Receipts remitted to the Treasury in accordance with law ... 1538
Solicitor, office of, summary of work of ... 1555
Standards, Bureau of, work of (*see also* Standards, Bureau of) ... 1590
Statement of President concerning ... 57
Statistics, Bureau of, work of ... 1585
Statistics, Bureau of (*see also* Statistics, Bureau of) ... 1590
Steamboat-Inspection Service, report of work of (*see also* Steamboat-Inspection Service) ... 1645
Suggestions for further legislation relative to ... 1524
Unexpended balances of appropriations ... 1539
Commerce and Labor, Secretary of, report of ... 1519
Commerce Court of the United States, business transacted in ... 811
Commerce Court, interstate commerce cases in ... 1771
Commercial fertilizers ... 1411

	Page.
Commissary General, Army, report of	424
Commissary General's office, Army, pay of acting assistant commissaries	435
Commissary General's office, Army, resources, disbursements, and balances	424
Commissioned officers in active service, Army	339
Commodity clause cases	779
Compensation to railways for carrying mails	53
Comptroller of the Currency, report of	133
Confederate soldiers and sailors, marking graves of	262
Constantly noneffective rate, Army	442
Constitutional right to reasonable freight rate	1764
Construction and Repair, Bureau of, Navy, report of chief of	952
Consular and Diplomatic Corps:	
Merit system in	7
Statistics as to merit and nonpartisan character of appointments	7
Contract surgeons, Army	523
Corn crop	1270
Corporations, Bureau of:	
Pending investigations of	1575
Reports published by	1574
Results of work of	1575
Trade Commission, proposed establishment of, suggestions relative to	1576
Corporation tax	196
Corporation tax and publicity	83
Corn culture, advances in	1385
Cotton corner case, status of	773
Cotton crop	1271
Cotton work, progress in, Department of Agriculture	1384
Council of National Defense	300
Courts-martial, Navy	913
Court officials, investigations of offices, conduct, etc., of, by Department of Justice, result of	807
Cow-testing associations	1414
Creameries and cheese factories	1415
Credit, instruments of	181
Criminal identification records received by the Department of Justice	823
Criminal indictments found under antitrust law	777
Criminal prosecutions under antitrust law	771
Crop Reporter, Department of Agriculture	1350, 1452
Crop results	1269
Crops:	
Barley	1273
Buckwheat	1274
Cereals, all	1275
Comparisons, summary of	1276
Corn	1270
Cotton	1271
Diseases of	1396
Flaxseed	1274
Hay	1270
Hops	1275
Increase over 1911	1276
Oats	1272
Potatoes	1273
Rice	1274
Rye	1274
Sugar	1275
Tobacco	1273
Wheat	1272
Crops resistant to alkali and dry-land conditions	1383
Crozier *v.* Fried. Krupp Aktiengesellschaft, abstract of decision of	825
Cuba, revolution in	26
Currency (*see also* Paper currency):	
Amount handled by the Register of the Treasury	210
Improvement in, contemplated	79
Spurious issues of	129
Currency notes, laundering of	71
Curtin *v.* Benson, abstract of decision of	825

Page.
Customs, Treasury Department 67
Daily Consular and Trade Reports 1581
Dairy farming 1306
Dairy manufactures 1307
Dairy problems, Department of Agriculture 1416
Dairy products 1277, 1311
Dairy research laboratories 1308
Deaf, Columbia Institution for the 1120
Deaths from all causes, Army 443, 460
Deming Investment Co. *v.* United States, abstract of decision of 841
Demonstration work, progress in, Department of Agriculture 1399
Dental and oral diseases in Army 505
Dental Corps:
  Army 524
  Navy 1012
Department heads, seats on floor of Congress for 49
Deposits, soldiers in Army 533
Desert-land entries, number of 1157
Desert lands, State, segregation of 1162
Desertions, Army 381
Diaz *v.* United States, abstract of decision of 829, 835
Diphtheria in Army 477
Diphtheria in Philippines 502
Diplomacy a handmaid of commercial intercourse and peace 9
Discharges, Army 443, 444, 455, 457
Diseases:
  Dental and oral, in Army 505
  Influence of arms of service 444
  Influence of race 445
  Malarial, in Army 492
  Prevalence of special 461
  Skin, among the Filipinos in Manila 496
  Tropical, board for the study of 491
  Typhoid, in Army 461
  United States (Continental) exclusive of Alaska 456
  Venereal, in Army 467
  Venereal, in Navy 983
Dissolution decrees obtained under antitrust law 767
District courts of the United States, business transacted in 810
District of Columbia:
  Employees of, in classified service 1738
  Statement of President concerning 59
  Transactions of United States Treasurer with 131
Division hospital, Manila, P. I 517
Docking facilities, Navy 890
Docks, Navy:
  Boston 892
  Graving 893
  Mare Island 892
  New York 890
  Norfolk 892
  Pearl Harbor 891
  Puget Sound 891
"Dollar diplomacy," business secured to our country through 16
Domain. (*See* Public domain.)
Dominican customs receivership 673
Drainage investigations, Department of Agriculture 1366, 1484
Drug investigations 1312, 1460
Dry-land agriculture investigations 1382
Dysentery bacilli carriers 499
Dysentery, epidemic of, at Ormoc, Leyte 498
Eastern Cherokees *v.* United States, abstract of decision of 834
Education:
  Alaska school service 1194
  Bureau of, report of the Secretary of the Interior on 1099
  Commissioner of, statement of 1189

	Page.
Education—Continued.	
General Board of	1122
Higher, division of	1189
Indians, and training of	1080
Miscellaneous	1197
Recommendations	1198
Rural, division of	1193
School administration, division of	1190
School hygiene and sanitation, division of	1191
Statistical division	1193
Eight-hour law for the building of battleships	955
Electricity, accidents in mines from	1218
Eleemosynary institutions under the Department of the Interior	1115
Elkins Act, cases under	783
Emery, 10-inch, disappearing carriage, Army	558
Employment office, Indian	1082
Engineer depots, Army:	
Fort Leavenworth	594
Honolulu	594
Manila	595
Vancouver Barracks	594
Washington Barracks	593
Engineer equipment of troops, Army	596
Engineer Post and School, Washington Barracks	598
Engineer troops, Army	579
Engineering Department, Army:	
Raising of the battleship Maine from Habana Harbor	256
River and harbor improvements	256
Statement of work of	256
Engineers, Army, Board of, concerning	581
Engineers, Army, Corps of:	
Noncommissioned officers of	579
Officers	577
Report of	577
Statement concerning	307
Engraving and Printing, Bureau of, report of	216
Enlarged homestead designations	1127
Enlisted men, Army	371, 441
Equitation	373
Erythrocyte count and hæmoglobin reading for healthy white soldiers living in Philippines	495
Estimates of appropriations	97
Europe and Near East, our relations with	20
Experiment Stations, Office of, work of	1353
Experimental mine, investigation at	1222
Experimental model basin, Navy	876
Explosives, mine accidents from improper handling of	1217
Exports:	
Analysis of agricultural	1280
Destinations of	1586
Foodstuffs and manufactures' raw material	1586
Manufactures	1585
Statistics regarding	1585
Fairbanks *v.* United States, abstract of decision of	830
Far East and China, relations with	22
Farm-management field studies and demonstrations, Department of Agriculture	1401
Farm-management investigations, Department of Agriculture	1400
Farm products:	
Price levels, present restoration of former	1279
Prices of, comparison	1278
Purchasing power of	1352
Farmers' Bulletins, demand for	1346
Farmers' institutes	1360, 1473
Federal court procedure, reform in	48
Federal Horticultural Board	1504
Feeding stuffs, commercial	1457
Fever of undetermined type	499

Page.
Fevers, undetermined, in Army 474
Field Artillery 308
Field Artillery, fire-control instruments for 558, 624
Field Artillery practice 557
Field-gun matériel 556
Field inspections and training, Army 371
Field officers, Army, test exercises for 441
Field service, General Land Office 1132
Fig wasp 1404
Financial statements, War Department 283
Fish:
  Cultural work by Bureau of Fisheries 1602
  Fry planted by Bureau of Fisheries 1603
Fisheries, Alaskan 1104, 1611
Fisheries, Bureau of:
  Commercial fisheries, report relative to 1608
  Fish-cultural work 1602
  Fry planted by, in States and Territories 1603
  Investigations and surveys by 1606
  Study of fish diseases abandoned by 1606
Fishery subjects before Congress 1616
Five Civilized Tribes 1087
Flaxseed crop 1274
Fleets. (*See* Navy.)
Floating dock, Navy 893
Food and Drug Inspection, Board of 1502
Food and drugs act:
  Enforcement of 1461
  Investigations under 1462
  Results of 1464
  Statements concerning 1290, 1510
Food and drugs, inspection of 1313
Food, Army 483
Food standards 1461
Foods, canning of 1310
Forage crops, special work on, Department of Agriculture 1379
Foreign embassies and legations, larger appropriations recommended for 8
Foreign relations, message of the President on 5
Foreign trade:
  Agricultural products 1280, 1282
  Increase in 14
  Necessity for greater governmental effort in retention and expansion of our foreign trade 28
  Statistics regarding 1585
Forest-fire losses of year 1325
Forest products 1282
Forest reserves:
  Agricultural lands in 1320
  Homestead entries in 1145
Forest resources 1497
Forest Service:
  Fire losses of the year 1325
  Forest management, progress in 1324
  Forest products laboratory 1498
  Investigations of 1328
  Kiln-drying 1497
  Management, problems of 1498
  National forest resources, use of 1492
  National forests, statistics of use of the 1500
  New woods for pulp 1497
  Policy of 1492
  Range management, progress in 1326
  Reforestation 1325
  Resources, forest 1497
  State and private cooperation 1327
  Strength of timbers 1496
  Wood distillation 1497

	Page.
Forest Service—Continued.	
Wood famine is recent, fear of	1488
Wood, preservative treatment of	1495
Work of	1316, 1323
Fortifications:	
Insular possession	590
Isthmian Canal	593
United States	581
Frankford Arsenal, Army	564
Freedmen's Hospital	1117
Fruit products, studies on	1310
Fruits and vegetables, examination of, in tin containers	431
Fruits, diseases of	1395
Fuel investigations	1210, 1213
Fur-seal treaty with Great Britain, need of amendment to our statute	17
Game, information concerning	1343
Game protection	1433
Game protection in Alaska	1343
Gas and oil, work on, by the Geological Survey	1202
Gas explosions, investigation of, by the Bureau of Mines	1216
General Hospital, Army and Navy, Hot Springs, Ark	515
General Hospital, Fort Bayard, N. Mex	512
General hospitals, Army	506
General Land Office:	
Abandoned military reservations	1146
Agents' reports not considered in adjudicating cases where trial had	1132
Alaska, field service investigations in	1134
Alaska, placer mining claims in	1151
Alaska surveys	1139
Area of land entered and patented	1131
Bird reservations	1149
California oil lands	1135
California school land grant, adjustment of	1143
Carey Act	1140
Carey Act, applications filed under	1064
Cash, receipts and expenditures of	1131
Centennial of	1130
Certified copies of records in surveyors general offices and local land office	1152
Charges, formulation of	1131
Chippewa lands, opening of, to homestead entry	1147
Chippewa logging and timber sales	1065
Commissioner's recommendations	1065
Field service of	1132
General statement of	1130
Homestead entries in forest reserves	1145
Imperial Valley lands	1143
Indian allotments	1146
Indian reservation openings	1146
Land offices, United States district	1155
Legislation	1065, 1150
Lieu selections for lands in Indian reservations	1146
National forests	1147
National monuments	1148
Power site, etc., reserves	1142
Public domain, statistics relating to the disposition of	1154
Public surveys of	1063
Railroad selections	1142
Reclamation entries and water-right charges	1151
Reclamation work of	1145
Recommendations of	1151
Regulation of professional locators and pernicious literature in relation to public lands	1151
Repayments	1137
Report of Commissioner of	1130
Reservoir declaratory statements	1141
Rights of way	1141

	Page.
General Land Office—Continued.	
State selections	1142
Statistics relating to the disposition of the public domain	1154
Sunk and lake lands in Arkansas	1144
Surveying	1137
Surveyors general, list of, offices of	1156
Swamp lands	1143
Texas-New Mexico boundary, reestablishment of	1139
Three-year homestead act	1150
Work of	1062
Geodetic work done by Coast and Geodetic Survey	1630
Geological Survey:	
Administrative branch	1070
Building, need of	1067
Classification of public lands by	1067
Director of, report of	1199
Educational work by	1203
Folios, work on	1201
Geologic branch	1068
Land classification policy	1204
Land classification, work in	1202, 1204
Oil and gas, work on	1202
Paleontologic work	1200
Publications branch	1069
Report on, by the Secretary of the Interior	1066
Scientific work, progress of	1199
Theoretic work by	1202
Topographic branch	1069
Water-resources branch	1069
Work of the year	1205
Gipsy moth	1333
Gipsy moth and brown-tail moth	1404
Glanders and other diseases	1427
Glasgow *v.* Moyer, abstract of decision of	846
Glickstein *v.* United States, abstract of decision of	840
Goat *v.* United States, abstract of decision of	841
Goethals, Col. George, proposed promotion of	45
Gold:	
Production of, in United States	216
Ratio of, to total stock of money	116
Gold certificates	119
Gold certificates handled by the Register of the Treasury	210
Gold-standard fund acts for Philippines	679
Government's appraising work, reform of	68
Government Hospital for the Insane	362, 1115
Government receipts and expenditures	30
Government workingmen's compensation act, administration of	1580
Governor of Porto Rico, report of	683
Grain standardization, Department of Agriculture	1392
Graves, marking, of Confederate soldiers and sailors	262
Grazing leases, Indian Office	1085
Great Britain:	
Final settlement of North Atlantic fisheries dispute	18
Fur-seal treaty with, and need of amendment to our statute	17
Special claims arbitration with	17
Grenades, Army	553
Gritts *v.* Fisher and MacVeagh, abstract of decision of	845
Guantanamo naval station	888
Gun mounts, Navy	943
Gunners' qualifications	639
Guns and mortars, Army	551
Guns, field, machine, and small arms, Navy	942, 946
Harvester Trust, status of case against	774
Hawaii:	
Health of troops in	485
Report of the Secretary of the Interior on	1108
Hay crop	1270

Page.

Health and sanitation:
- Army ... 237, 439
- Indians ... 1082

Heckman *v.* United States, abstract of decision of ... 840
Heirships, Indian, determination of ... 1082
Helmets of varying colors for Army ... 493
Hendricks *v.* United States, abstract of decision of ... 832
Hepburn Act, cases under ... 783
Herrera *v.* United States, abstract of decision of ... 829
Highway engineers, training ... 1467
Hog cholera ... 1304
- Causes of ... 1426

Home Army, reorganization of, statement of President concerning ... 36
Home ports, matériel in ... 645
Homestead act, three-year ... 1150
Homestead designations, enlarged ... 1127
Homestead entry, opening of Chippewa lands to ... 1147
Homestead entries:
- Forest reserves, in ... 1145
- Number of ... 1156

Homestead laws ... 1034
Hop crop ... 1275
Horse breeding, experiments in ... 1301
Horses, diseases of ... 1428
Hospital Corps:
- Army ... 525
- Navy ... 1006

Hospitals:
- Freedmen's ... 1117
- Insane, Government, for the ... 1115
- General, Army ... 506

Hours-of-service act ... 1792
- Cases under ... 783
- Judicial interpretation of ... 1793

House Committee on Expenditures in the Treasury Department, assistance given Treasury Department by ... 86
House resolution 343, Sixty-second Congress, second session ... 304
Howard University ... 1119
Howitzer matériel ... 556
Huse *v.* United States, abstract of decision of ... 828
Hussey *v.* United States, abstract of decision of ... 826
Hyde & Schneider *v.* United States, abstract of decision of ... 836
Hydroelectric power. (*See* Water power.)
Immigration, sources of ... 1568
Immigration Service:
- Administration of by Department of Commerce and Labor ... 1526
- Bureau of Immigration and Naturalization, report of ... 1567
- Immigration stations ... 1570
- Information, Division of, work of ... 1571
- Naturalization, Division of, work of ... 1573

Immigrants:
- Ages of ... 1567
- Financial condition of ... 1567
- Japanese and Korean laborers ... 1569
- Literacy of ... 1567

Imperial Valley, Cal. ... 18, 1143
Import trade, characteristics of ... 1588
Imports:
- Agricultural products ... 1282
- Statistics regarding ... 1585

Injunctions, preliminary, Interstate Commerce Commission ... 1765
Index-record card work ... 366
Indian affairs:
- Administrative plant ... 1249
- Allotted lands, leases of ... 1258
- Allotted lands, sale of ... 1259
- Allotments ... 800, 1146, 1257
- Ceded lands, use of ... 1250

Indian affairs—Continued. Page.
Commissioner of, Report of ... 1225
Decade of ... 1225
Defects, present ... 1233
Depositaries for individual moneys ... 1264
Depredation claims, summary of report of Assistant Attorney General relative to ... 817
Education and training ... 1080
Employees in the field ... 1264
Employment office ... 1082
Five Civilized Tribes ... 1087
Forestry ... 1251
General administration of ... 1077
Grazing leases ... 1085
Health and sanitation ... 1082
Heirships, determination of ... 1082
Individual moneys ... 1262
Inherited lands, sale of ... 1259
Irrigation ... 1254
Irrigation works ... 1084
Lands, taxation of ... 1081
Law and order among Indians ... 1246
Liquor laws, enforcement of ... 1083
Liquor traffic, suppression among Indians ... 1246
Office of, Report of the Secretary of the Interior on the ... 1075
Oil leases ... 1086
Property of the Indians ... 1250
Recommendations of the Secretary of the Interior concerning ... 1059
Religious work among the Indians ... 1087
Restrictions, removal of ... 1079
Sanitation and health ... 1082
Schools of Indians ... 1241
Supplies ... 1086
Timber lands ... 1083
Traders' claims ... 1086
Indian allotments ... 1146, 1257
Indian allotments, suits brought by Attorney General to cancel unlawful conveyances of ... 800
Indian and public lands entered since 1906 ... 1162
Indian reservations:
Lieu selections for lands in ... 1146
Minerals on ... 1255
Openings of ... 1146
Indians:
Art of ... 1241
Health of ... 1237
Industries of ... 1239
Stock raising by ... 1240
Infantile beriberi ... 492
Infantry ... 313
Injurious insects, importations of ... 1403
Insane, Government Hospital for the ... 1115
Insanity in Army ... 476
Insecticide and fungicide act ... 1292, 1511
Insecticide and fungicide board ... 1289, 1503
Insecticides and fungicides, investigation of ... 1314, 1456
Inspector General, War Department, Report of ... 369
Inspector General's Department ... 324
Inspector General's Office, Army:
Inspection by ... 370
Personnel ... 369
Instruments of credit ... 181
Insular Affairs, Chief, report of ... 653
Insular ports, material in ... 647
Insular possessions ... 255
Interest checks handled by the Register of the Treasury ... 209

	Page.
Interior, Department of the:	
Appendixes to report of Secretary of	1125
Assistant Attorney General, office of	1060
Education, Bureau of	1099
Education, statement of the Commissioner of	1189
Eleemosynary institutions under	1115
General Land Office (*see also* General Land Office)	1062
General Land Office, Report of Commissioner of	1130
Geological Survey (*see also* Geological Survey)	1066
Geological Survey, Report of the Director of	1199
Indian Affairs. (*See* Indian affairs.)	
Indian Affairs, Office of	1075
Indian Affairs, Report of the Commissioner of	1225
Mines, Bureau of	1073
Mines, Report of the Director of	1206
National monuments under	1113
National parks and reservations under	1111
Patent Office	1097
Patents, Report of Commissioner of	1183
Pension Office (*see also* Pension Office)	1092
Pensions, Report of Commissioner of	1164
Reclamation Service. (*See* Reclamation.)	
Reclamation Service	1070
Secretary of, report of	1031
Statement of President concerning	54
Territories under	1102
General review and recommendations of	1031
Report of	1031
Internal Revenue, Commissioner of, report of	188
Internal-Revenue Service:	
Administration of	70
Claims	202
Corporation tax	196
Cost of collecting internal-revenue taxes	191
Division of Chemistry, work of	201
Objects of taxation, statistics regarding	191
Receipts of	188
Receipts in large tax-paying districts	189
International boundaries, survey of	1636
International Commission of the Congresses of Navigation, permanent	606
International Commission of Jurists	19
International Congress of Hygiene and Demography	238
International congresses and expositions, Department of Commerce and Labor represented at	1548
International fishery affairs	1618
International Waterways Commission, the	261
Interstate Commerce Commission:	
Accidents, investigation of railway	1795
Ash-pan law	1792
Branch lines, cases on physical connection with	1770
Commerce Court, cases in the	1771
Constitutional right to reasonable rate, case on	1764
Docket, formal	1748
Docket, fourth section	1747
Docket, informal	1747
Docket, investigation and suspension	1748
Docket, special	1747
Fourth section	1754
Hours of service act	1792
Hours of service act, judicial interpretation of	1793
Injunctions, preliminary	1765
Inquiry, division of	1750
Investigations by	1748
Locomotive boilers, inspection of	1799
Lumber cases	1758
Mandamus to take jurisdiction, cases of	1768
Negative orders not reviewable, case of	1760

Interstate Commerce Commission—Continued. Page.
Railway accidents ... 1784
Rate schedules and application of rate ... 1749
Rates, cases on restricted ... 1767
Recommendations of ... 1803
Report of ... 1747
Safety-appliance act, judicial interpretation of ... 1790
Safety appliances ... 1790
Statistics, Division of ... 1771
Supreme Court, cases decided by ... 1758
Tariff schedules, suspension of proposed changes in ... 1755
Water carriers, cases on account of ... 1769
Interstate Commerce Commission *v.* Diffenbaugh, abstract of decision ... 824
Interstate Commerce Commission *v.* Great Northern Railway Co., abstract of decision of ... 838
Interstate Commerce Commission *v.* Northern Pacific Railway Co., abstract of decision of ... 838
Interstate Commerce Commission *v.* Union Pacific Railroad Co., abstract of decision of ... 838
Interstate-commerce law, matters arising under ... 779
Intoxicating liquor, illegal shipments of, cases of ... 805
Irrigation:
Indian ... 1084
Investigations, Department of Agriculture ... 1364, 1482
National policy ... 1051
Isthmian Canal:
Fortification of ... 558, 593
Matériel ... 648
Isthmian Canal Commission:
Construction and engineering report on ... 708
Disbursements ... 754
General remarks ... 761
Organization of ... 706
Report of ... 706
Washington office ... 760
Japan, special mission of condolence to ... 23
Johannessen *v.* United States, abstract of decision of ... 833
Johnson *v.* United States, abstract of decision of ... 845
Judge Advocate General's Department, Army ... 322
Judge Advocate General of the Navy, report of ... 907
Judge Advocate General, War Department, report of ... 375
Jurists, International Commission of ... 19
Justice, Department of:
Appropriations and estimates ... 813
Court officials, investigations of offices, conduct, etc., results of ... 807
Criminal identification records received by ... 823
Customs Division ... 816
Indian matters ... 802
Investigation, Bureau of, work of, in general ... 803
Matters arising under interstate-commerce laws ... 779
Opinions of Attorney General ... 810
Pardons considered by ... 818
Parole law, administration of ... 819
Personnel of ... 764
Prosecutions under antitrust law ... 765
Public Lands Division, work of ... 795
Statement of the President concerning ... 47
Ker & Co. *v.* Couden, abstract of decision of ... 825
Knox, Secretary, visit to Central America and the Caribbean ... 13
Labor, Bureau of:
Bulletins published by ... 1578
Government workingmen's compensation act, administration of ... 1580
Reports published by ... 1577
Lacey Act ... 1293, 1508
Land classification by the Geological Survey ... 1202–1204
Land grants to railroads ... 1159
Land office. (*See* General Land Office.)

Page.
Land offices, United States district 1155
Lands. (*See* Public domain and public lands.)
Lands, Indian, taxation of 1081
Lands, unappropriated on June 30, 1912 1163
Latimer *v.* United States, abstract of decision of 831
Laundering of currency notes 71
Laws:
  Homestead 1034
  Mining 1038
Leary, administratrix of Leary, *v.* United States, abstract of decision of 841
Leases, coal-land 1036
Leggins, the disadvantage of, for routine wear in the tropics 494
Legislation, recommendations of Commissioner of Education 1198
Letterman General Hospital, San Francisco, Cal 506
Library, Agriculture, Department of 1353, 1486
Library of Congress, employees of 1738
Library, Weather Bureau 1449
Life-Saving Service 77
  Establishment, rebuilding and improvement of stations 229
  Miscellaneous services of crews 228
  Motor-boat accidents 229
  Operations of 227
  Power boats for rescue work 228
  Sources of assistance to vessels 227
Lighthouse depots 1628
Lighthouse Service:
  Administration methods and economies 1620
  Apparatus, improvement in 1626
  Appropriations for 1623
  Cooperation with other branches of Government service 1622
  Engineering and construction work under 1625
  Increase in aids to navigation 1624
  Legislation affecting 1622
  Rearrangement of 1548
  Reorganization of 1618
  Saving of life and property 1629
  Vessels 1628
Liquor laws, enforcement of, as to Indians 1083
Liquor traffic, suppression among the Indians 1246
Live stock, inspection of, for export, Department of Agriculture 1419
Live-stock products 1277
Live-stock quarantine acts 1292
Locomotive boilers, inspection of 1799
Low Wah Suey *v.* Backus, Commissioner of Immigration, abstract of decision of 845
Lower Colorado River, work along the 1058
Lumber Trust, status of case against 773
Manufactures, Bureau of:
  Commercial agents of 1583
  Facilities of 1584
  Foreign Tariffs, Division of, work of 1582
  Work of, in general 1581
Mails, compensation to railways for carrying 53
Maine, battleship:
  Raising of, from Habana Harbor 256
  Removal of wreck of, from Harbor of Habana 616
Malaria in Army 472
Mammals, distribution and habits of native, and birds 1432
Mandamus to take jurisdiction, Interstate Commerce Commission 1768
Maneuver camps 360
Maneuvers, in Army 321
Manila (P. I.) division hospital 517
Manila ordnance depot 572
Manila Railroad Co 658
Manufactures, exports of 1585
Maps, War Department 598
Marine barracks and quarters 920

Marine Corps: Page.
Advanced-base school 1022
Aviation in 1024
Barracks and posts 1026
Campaign badges 1022
Company organization 1020
Competitions 1021
Cooks and bakers in 1021
Distribution of force 1016
Enlisted force 1016
Expeditionary forces 1022
Good-conduct medals 1017
Major General Commandant of, report of 1015
Matériel 1025
Military attachés 1025
Officers of, instruction of, at Army schools 1025
Personnel of 1015
Physical training in 1019
Posts and barracks 1026
Recruit depots 1018
Recruiting 1017
Retirements, resignations, etc., of officers of 1017
Rifle range, Winthrop, Md 1027
Rifle team of 1021
Savings deposits of men in 1017
Ships' detachments 1020
Target practice 1020
Training for sea service 1020
Transports needed for 1024
Marine Engineering, School of 900, 928
Marine meteorological charts 1441
Marine Officers' School 1024
Marine work of Weather Bureau 1298
Maritime Canal Co. of Nicaragua 1124
Marking graves of Confederate soldiers and sailors 262
Maryland School for the Blind 1121
Materials, properties of, determination of, by Bureau of Standards 1599
Matériel in home ports 645
Matériel in the insular ports 647
Maximum and minimum tariff provision, advantage of 15
Measles in Army 477
Meat inspection 1292, 1300, 1417
Meat-inspection law 1510
Medals of honor 367
Medals, Philippine service 368
Medical and hospital supplies, Army 528
Medical Corps:
Army 522
Navy 1010
Medical Department, Army 327, 521
Admission rates for external causes 443
Comparison of with foreign armies 445
Influence of age and length of service 478
Influence of race 480
Influence of season 479
Influence of station 477
Officers 439
Officers retired 439
Total admissions to sick report 442
Medical Museum, Army 530
Medical Reserve Corps 523
Medical School, Army 525
Mediterranean fruit fly 1337
Memorial to John Wesley Powell 1124
Meningitis, cerebrospinal, in Army 476

	Page.
Merchant marine of the United States:	
Free ships	1639
Tonnage of	1638
Messages of the President:	
Fiscal, judicial, military, and insular affairs	29
Foreign relations	5
Work of the Departments of the Post Office, Interior, Agriculture, and Commerce and Labor, and District of Columbia affairs	49
Metal-mining industries, need of extending investigations by Bureau of Mines to	1215
Meteorological charts, marine	1447
Mexico, policy toward	13
Mexican border:	
Sanitation in camps on	481
Troops enforcing neutrality laws on	362
Mexican cotton-boll weevil	1404
Microchemical studies	1311
Military Academy	254, 319, 353
Military aeronautics	631
Military prison, United States	362
Military operations in Mindanao	240
Military prison administration	253
Military prisoners	382
Military reservations, abandoned	1146
Military telegraph lines	626
Militia:	
Division districts	317
Federal pay bill	318
General remarks	315
Joint maneuvers	252
Maneuvers in	321
Naval	904, 922, 934
Organized	315, 526
Pay Department, Army, pay	533
Progress of organized, during the past year; joint maneuvers	252
Militia armories, matériel for	558
Milk, investigations of market	1307
Milk, improvement of market	1415
Mineral-land withdrawals	1129
Minerals on Indian reservations	1255
Mine fires, investigation of	1219
Mine gases, occurrence of	1224
Mine lighting and accidents	1218
Mine planters	642
Mine-rescue stations, work at	1221
Mine-safety and mining conditions, improvements in	1207
Mine-safety laws and regulations	1209
Mine-safety work and investigations	1220
Mines and mining, Alaska	1103
Mines, Bureau of:	
Accidents, investigations of	1211
Benefits of the work of	1207
Director of, report of	1206
Experimental mine, investigations at	1222
Fuel investigations of	1210, 1213
Investigations by	1216
Metal-mining industries, need of extending investigations to	1215
Mine-safety work and investigations	1220
Purpose of	1206
Report of the Secretary of the Interior on	1073
Rescue cars and stations	1212
Safety demonstration by	1213
Mines, number of men employed in and number killed in	1209
Mines; ventilation, need of better	1218
Mining laws	1038
Minor coin	127
Mints, operations of	215

Page.
Mint service, report of 215
Mississippi flood sufferers, relief of 241
Mississippi River Commission 605
Mobile artillery, supply of 556
Monetary stock of the United States 116
Money:
Circulation, amount in 117
Circulation and population, statistics showing 117
Distribution of, in United States 177
In banks 176
Laundering of 217
Ratio of gold to total stock of 116
Stock of 116
Money rates 139
Monuments, national, preservation of 1113
Moore *v.* Elliott, abstract of decision of 832
Morocco, relations with 22
Morbidity, causes of, mortality, and invaliding in the Philippines 496
Motility in the Widal reaction, the variable relation between the clumping and the stoppage of 497
Motor-boat accidents 229
Mount Weather (Va.) Research Observatory, work of 1447
Mountain Artillery 555
Mullen *v.* United States, abstract of decision of 840
National-bank circulation, profit on 155
National-bank decisions, digest of 183
National-bank loans, character of 137
National-bank notes:
Circulation 151
Redemption of 128
National-bank redemption agency receipts and redemptions 154
National banking laws, violations of 806
National banks (*see also* Banks):
Bonds, circulation, capital stock, etc 152
Bonds held as security for 109
Bond investments by 147
Changes in loans, bonds, cash, and deposits 145
Changes in title and location of 162
Charters, extensions and expirations of 161
Circulation issued, redeemed and outstanding 153
Classification of, by capital stock 144
Condition of 133
Designation of, as depositaries of the United States 111
Earnings and dividends of 150
Examinations by directors' committees 185
Expenses incident to the issue of circulation and expenses of the Currency Bureau 156
Holdings in detail 149
Insolvent 164
Organization of, number, etc 157
Percentages of principal items of assets and liabilities of 148
Productivity of loans and bond investments 148
Public deposits in 113
Relation of capital to deposits, etc 144
Reserve and deposits of 140
Saving depositors and deposits in 143
Status of bank when place in which organized has been annexed to adjacent city 163
Voluntary liquidations of 164
National cemeteries 385
National Commercial Congress 1582
National currency associations 182
National defense, council of 253
National forests 1147
Occupation of, by power companies 799
Resources, use of 1492
Statistics of use of the 1500

Page.
National game and bird reservations 1341
National Guard, the 250
National Guard, statement of President relative to 37
National monuments 1148
National monuments and preservation of American antiquities 1113
National Packing Co., dissolution of 772
National parks and reservations, area of 1111
National parks and reservations, report of the Secretary of the Interior on 1111
National parks; location, area, and characteristics of 1129
National volunteers 252
Naturalization, petitions, etc., for 1573
Naval Academy:
Administration of discipline at 926
Curriculum of 900, 927
Dairy at 980
Midshipmen's practice cruise 926
Output of 899, 925
Naval Gun Factory 878, 948
Naval dispensaries and sick quarters 1003
Naval hospitals 920, 1008
Naval homes, pensions of inmates of 904, 933
Naval Institute 929
Naval Medical School 1001
Naval Militia 904, 922, 934
Naval Militia, medical instruction of 1001
Naval Observatory:
Consolidation of, with Hydrographic Office 906, 941
Work of 939
Naval offenses, detention system of punishment for 902
Naval powder factory 878, 950
Naval powers, relative standing of 867
Naval proving ground 949
Naval Reserve 905, 934
Naval reviews 921
Naval stations (*see also* Navy yards):
Floating cranes at certain 920
Guantanamo 888, 919
Magazines at 920
Pearl Harbor 919
Naval torpedo station 950
Naval War College 899, 928
Naval warfare, uses contemplated for aviation 937
Navigable waterways and their appurtenant water power 257
Navigation:
Alaska, aids to 1107
Bureau of, report of Chief of 921
Laws, enforcement of 1643
Receipts 1644
Navy:
Annual program of building ships necessary 867
Appropriations for, should be available until expended 883
Armor for 945
Asiatic 856
Athletics in 998
Atlantic fleet 853
Aviation 873, 937
Civil-service clerks under, on foreign duty 979
Coal and fuel oil for 975
Coal-storage plants of 921
Coal tests by 966
Commissary stores 978
Condemned material 980
Construction and Repair, Bureau of, report of Chief of 952
Cost-accounting systems 971
Council of National Defense 851
Courts of inquiry 916

Navy—Continued. Page.
Courts-martial, general ... 913
Deaths in ... 985
Deck courts ... 915
Dental Corps ... 1012
Desertions ... 933
Diseases—
Gastro-intestinal ... 983
General ... 981
Skin ... 983
Venereal ... 983
Docking facilities ... 890
Docks. (*See* Docks.)
Drowning in ... 996
Dry docks ... 917
Engineering competitions ... 871
Engineering experiment station of, at Annapolis, Md ... 969
Enlisted men—
Demands upon ... 929
Increase in ... 930
Mechanical training for ... 902
Offenses, schedule of principal ... 914
Personnel ... 901
Physical training of ... 932
Qualifications of ... 923
Recreation rooms of ... 2, 932
Service records of ... 932
Training of ... 930
Enlistment laws, amendment of ... 929
Equipment, Bureau of, abolishment of, recommended ... 979
Examining boards of candidates for admission to the Navy as officers ... 916
Examining boards, work of ... 916
Experimental firing by ... 878
Experimental model basin ... 876
Experimental work conducted by Bureau of Ordnance ... 948
Field guns ... 946
Fleets—
Atlantic torpedo ... 856
Mobilization of ... 857
Pacific ... 853
Pacific torpedo ... 856
Panama Canal does not double fleet ... 867
Preparedness as regards repairs ... 865
Proposed new construction ... 866
Reserve ... 863
Fuel for the fleet ... 879
Fuel oil and gasoline storage plants of ... 921
General Board, recommendations of ... 868
General storekeeping system ... 971
Gun mounts ... 877, 943
Gunnery ... 870
Guns ... 942
Health conditions in ... 893
Historic ships ... 881
Hospital Corps ... 1012
Hydrographic Office, work of ... 940
Hygienic features of ... 985
Injuries ... 981, 985
Inspection and material ... 874
Inspection of clothing and other material for ... 974
Judge Advocate General, report of ... 907
Legislation for, recommended by the Secretary of the Navy ... 906
List of vessels of ... 957
Machine guns ... 946
Meat inspection for ... 974

	Page.
Navy—Continued.	
Medical Corps	1010
Medical Department, estimates for	1009
Medical Reserve Corps	1011
Naval reserve	905
Navigation, Bureau of, report of Chief of	921
Needs of	889
Nurse Corps	1013
Nurses in, medical training of	1002
Officers—	
Assignment of flag officers and captains	896
Civil employment of	901
Condition of officers' list	925
Detail of	923
Employment of, by contractors	973
Flag, need of more	894
Mechanical training for	902
Medical instruction of	1001
Offenses, schedule of principal	914
Physical exercise required	924
Qualifications of	896, 923
Retired, civil employment of	923
Special ordnance instruction taken by certain	928
Ordnance, Bureau of—	
Aeroplanes manufactured by	947
Report of Chief of	942
Ordnance material loaned by	878
Ordnance material manufactured by, for other services	947
Overhaul periods	884
Paymaster General, report of	969
Paymasters' clerks	924
Personnel	893
Physical training in	894, 998
Powder	877
Powder, manufacture of	943
Power plants for stations and yards	917
President's comment regarding	859
Projectiles	945
Proposed personnel bill	898
Purchases and contracts	972
Radio stations	920
Radiotelegraphy	880, 936, 967
Rations	978
Receiving ships	881
Reforms in administration of justice in	907
Relative standing of United States with regard to	867
Reservation of coal and oil lands for	879
Retiring boards, work of	916
Sanitary features of	985
Ship-inspection reports, revision of	872
Small arms	871
Special operations in Central American waters	854
Standard ships organizations	872
Steam Engineering, Bureau of, report of Chief of	965
Subaqueous tests	879
Supplies and Accounts, Bureau of, report of Chief of	969
Surgeon General—	
Operations of	1001
Recommendations of	1013
Report of	981
Torpedoes and mines	947
Torpedoes made by the	878
Unattached vessels in active service	856
Washington's words regarding war	866
Yards and Docks, Bureau of, report of Chief of	917
Navy Department:	
Accounting work in, progress of	882
Aids to the Secretary	847

	Page.
Navy Department—Continued.	
Compensation of employees of	904
Equipment, Bureau of, recommendations relative to	851
Employment of expert on scrap metals	884
General storekeeping system of	971
Office space required by	852
Statement of President concerning	45
Navy mail service	1687
Navy, Secretary of, report of	847
Navy yards:	
Administration of	884
Closing of	889
Coordination	885
Cost accounting in	882
Future of	885
Inspection at	884
Shipbuilding work at	952
Shop management	886
Near East and Europe, our relations with	20
Neutrality laws, enforcement of	12
New England vessel fisheries, report concerning	1608
New York Arsenal	569
New York Assay Office	216
Niagara Falls, preservation of	609
Nicaragua:	
Landing of marines and bluejackets in	12
Maritime Canal Co. of	1124
Revolution in	27
Nonmilitary duty and poor administrative methods	314
North Atlantic fisheries dispute, final settlement of	18
Nurse corps:	
Army	524
Navy	1013
Nutrition investigations, Department of Agriculture	1479
Oat crop	1272
Ocean steamers, radio communication on	1641
Oil and gas, work on by the Geological Survey	1202
Oil-land suits against the Southern Pacific Railroad Co	796
Oil-land withdrawals and restorations	1126
Oil lands:	
California	1135
Reserved for the Navy	879
Oil leases, Indian lands	1086
Oleomargarine, statement of Secretary of the Treasury concerning	80
Opium	19, 82
Opium conference	19
Ordnance Board, Army	572
Ordnance Department, Army:	
Amounts covered into surplus fund	537
Comparison of fiscal statements	537
Employees, cash rewards for	544
Fiscal affairs	534
Payments by	536
Personnel	534
Recapitulation of savings by	544
Savings from improved shop management and premium system and disposition thereof, by	542
Scientific management of	537
Stock fund not yet utilized	544
Surplus stock savings by	543
War plans of	550
Ordnance equipment for Coast Artillery	550
Ordnance equipment for mobile Army	549
Ordnance, Navy, report of chief of Bureau of	942
Ordnance property, Army, returns, examination and settlement of	545
Ordnance stores, Army, transfers and sales of	536
Oregon and California land-grant suits	796

Page.
Overhaul periods, Navy ... 887
Oyster industry of Atlantic and Gulf States, report of ... 1608
Pacific coast fisheries, report of Bureau of Fisheries concerning ... 1610
Pack outfits, Army ... 555
Paleontologic work of the Geological Survey ... 1200
Panama Canal:
Accounts and disbursements, examination of ... 750
Atlantic division, work on ... 715
Central division, work on ... 725
Completion of ... 279
Concrete work on ... 277
Cost keeping system ... 745
Culebra cut ... 276
Excavation ... 274
Force employed ... 279
Fortifications ... 278, 745
Gatun Dam ... 278
Health conditions and sanitation ... 278
Legislation ... 281
Navy's needs at ... 889
Pacific division, work on ... 731
Promulgation of tolls ... 283
Second division, chief engineer's office ... 738
Second visit of Secretary of War to ... 281
Slides ... 276
Statement of the President concerning ... 44
Terminals ... 278
Tolls ... 282
Panama Canal bonds ... 102
Panama Canal treaty ... 45
Panama-Pacific International Exposition ... 58
Panama Railroad Co ... 280, 743
Paper currency (*see also* Currency):
Amount issued ... 124
Amount prepared for issue ... 124
Average life of ... 123
Change in design and size of notes ... 156
Changes in denominations ... 120
Condition of ... 118
Cost of ... 122
Denominations, outstanding ... 121
Gold certificates ... 119
Laundering of ... 71
Philippines ... 661
Pieces outstanding ... 121
Ratio of small denominations to all ... 122
Redemptions of ... 125
Reduction in size of ... 218
Silver certificates ... 120
Supply held in reserve ... 125
Treasury notes of 1890 ... 119
United States notes ... 119
Parcel post ... 52, 1653
Pardons considered by the Department of Justice ... 818
Parks and reservations, national ... 1111
Parole law, administration of, by Department of Justice ... 819
Passenger steamers, overloading of ... 1648
Patent frauds ... 794
Patent Office, report of the Secretary of the Interior on the ... 1097
Patents:
Appellate work ... 1186
Applications received during year ... 1183
Commissioner of, report of ... 1183
Expenditures ... 1184
Independent bureau desirable ... 1187
Receipts from all sources ... 1184
Pay Department, Army ... 327

Page.
Paymaster General, Army, report of 531
Paymaster General, Navy, report of 969
Paymaster General's Office, Army:
Allotments 532
Beneficiaries 532
Clerks in 532
Paymasters' clerks, Navy 924
Peace, successful efforts in promotion of 9
Pearl Harbor Naval Station 888
Pension act of May 11, 1912, rates under 1094
Pension Office:
Appeals and bounty land claims 1096
Report of the Secretary of the Interior on 1092
Pensioners:
Act of April 19, 1908 1173
Act of February 6, 1907 1173
Act of May 11, 1912 1174
Appeals 1179
Appropriations and disbursements for fiscal year 1912 1166
Bounty land warrants 1178
Certificates issued 1172
Civil War service, length of 1180
Criminal and civil suits 1178
Disbursements for, 1866 to 1912 1168
Gains and losses 1164
General statement of 1164
Historical 1180
Length of service 1176
Miscellaneous 1181
Number of, by States and Territories 1182
On rolls, June 30, 1912 and 1911 1165
Report of Commissioner of 1164
Special acts 1177
Ten years' summary 1177
Wars and Peace Establishment 1171
Personal identification system, Army 365
Philadelphia Co. *v.* Stimpson, abstract of decision of 828
Philippine Commission:
As a chamber of Philippine legislature 675
Exclusive legislative jurisdiction of 674
Recommendations of 681, 682
Report of 671
Philippine Islands:
Bonded indebtedness 662
Citizenship 653
Civil service in 1740
Commercial and financial activity, evidences of 678
Commercial development 677
Commercial statistics 662
Currency 660
Depositaries in United States for 661
Diphtheria in 502
Disbursements 662
Education in 667
Engineer Department, Army, contingencies 597
English, a common language in 668
Exports of 604
Fresh beef and mutton in the 435
Fresh vegetables in 436
Gold standard fund acts 679
Health of American troops in 486
Imports into 663
Increase amount of land that may be homesteaded 657
Increase of limit of bonded indebtedness for public works 654, 681
Inspection by War Department 370

Philippine Islands—Continued. Page.
Legislation enacted by Sixty-second Congress, second session 653
Legislative control, to restore over allotment of internal-revenue collections to the legislature of 656
Legislature of 666
Marine brigade in 1030
Military structures 593
Mining laws, amendment of 657
National, our, policy in the light of the accomplishment of a decade of civil government 267
Paper currency in 661
Pending and needed legislation 654
Postal savings banks in 659
Prevalence of diseases, by races, in the 489
Public order in 658
Railroads in 658
Receipts and disbursements, insular 666
Review of past year and legislative recommendations 271
Sanitation in 490
Silver-certificate reserve 656
Silver coinage 661
Statement of the President concerning 40
Supplies, purchase of 662
Troops sent to 337
Typhoid fever in 497
Water supply in 490
Philippine Railway Co 659
Philippine Scouts, Army 334, 375, 487
Philippine service medal 368
Phosphate land withdrawals and restorations 1126
Physical constants, determination of, by Bureau of Standards 1597
Picatinny Arsenal, Army 571
Placer mining claims in Alaska 1151
Plant Industry, Bureau of, work of 1308
Plant physiological chemistry, investigation in 1312
Plant physiological investigations 1398
Plant physiology and pathology, progress in, Department of Agriculture 1394
Plant quarantine act 1512
Plummer *v.* United States, abstract of decision of 832
Poisonous-plant studies, Department of Agriculture 1398
Political activity of officeholders and political assessments 1730
Pomology, progress in, Department of Agriculture 1390
Port of Manila and the port district 679
Porto Rican Regiment, Army 329
Porto Rico:
Advance in educational and vocational training 264
American citizenship 266
Bubonic plague in 264
Charitable institutions 704
Civil service in 695, 1740
Education 671, 702
External commerce 687
General conditions in 668
Governor of, report of 683
Harbors and docks 700
Health and sanitation in 671
Health of troops in 484
Insular police in 695
Irrigation project in 701
Labor conditions in 703
Legislation 265, 671, 672, 690
Material prosperity of the island 263
Municipalities, creation of new 696
Penal institutions 705
Public buildings 699
Public lands 699
Public works, buildings and lands in 671, 697

Porto Rico—Continued. Page.
Purchases and disbursements ... 672
Recommendations by Secretary of War ... 267
Roads in ... 697
Sanitation service ... 692
Statement of the President concerning ... 39
Telephone and telegraph service in ... 698
Transfer, the, of Federal property to the insular government ... 266
Post Office Department, receipts and disbursements on account of ... 103
Postage rates, readjustment of ... 1654
Postal finances ... 1651
Postal laws, violations of ... 805
Postal service:
Aeroplane mail service ... 1659
Appropriations and expenditures in office of First Assistant Postmaster General ... 1700
Canceling machines ... 1693
Changes in, recommended ... 1666
City Delivery, Division of, report of ... 1710
Compensation to railways for carrying the mails ... 1656
Consolidation of the third and fourth classes of mail ... 1654
Crusade against fraudulent use of the mails ... 1661
Efficiency records ... 1691
Eight-hour law ... 1691
Employees—
Annual vacations of ... 1659, 1690
Clerical and carrier forces ... 1688
Compensation to ... 1701
Higher entrance salary for ... 1689
Injured and superannuated ... 1692
Pensions for superannuated ... 1660
Relief from Sunday and holiday service ... 1689
Substitutes ... 1689
Expenditures and revenues (comparison with preceding year)—
Expenditures for 1913 ... 98
Expenditures for 1914 ... 100
Extension of ... 1651
Financial summary ... 1678
First Assistant Postmaster General, report of ... 1682
Franking privilege ... 1655
Gross revenues ... 1682
Improvements in the ... 1662
Labor-saving devices ... 1692
Legislation recommended for ... 1666
Motor vehicles delivery and collection service ... 1697
Navy mail service ... 1687
Ocean mail service ... 1658
Parcel post ... 1696
Postmasters' appointments, division of, report of ... 1706
Post offices, new organization of ... 1688
Private mail receptacles ... 1697
Railway Mail Service, reorganization of ... 1657
Readjustment of postage rates ... 1654
Revenues and expenditures (comparison with preceding year) ... 1678
Rural Delivery Service, manner of making appointments to ... 1719
Rural mail service ... 1658
St. Louis post office a model ... 1699
Salaries and Allowances, Division of, report of ... 1708
Salaries of supervisory officers ... 1660
Salaries of supervisory officers and expert distributers ... 1687
Shipment of periodicals by freight ... 1656
Standardization of post-office furniture and fixtures ... 1699
Street letter boxes ... 1696
Sunday service ... 1659
Village delivery service ... 1657, 1698
Postal Savings Bank System ... 52
Postal savings bonds, investments therein ... 111

Page.
Postal savings funds, United States bonds held as security for 110
Postal Savings System 1652
Postal telegraph service 1659
Postmaster General, report of the 1651
Postmasters:
Appointment of presidential 1683
Assistant postmasters covered in classified service 1684
Classification of, under civil service 53, 1661
Compensation to 1700
Extension of the classified service to cover certain 1684
Official bonds of 1686
Performance of duties by 1684
Salaries of 1685
Salaries of assistant 1685
Potato crop 1273
Poultry and egg investigations 1302, 1308
Poultry products 1277
Powder, Navy 877, 943
Powder factory, Navy 950
Powell, John Wesley, memorial to 1124
Power plants for naval stations 917
Power presses in Bureau of Engraving and Printing 74, 218
Power-site reserves 1127
Power sites, etc., reserves, General Land Office 1142
Powers *v.* United States, abstract of decision of 831
President elect, protection of 86
President Taft's statement regarding United States Navy 859
Prisoners, Army:
General 363
Guarding the 373
Military 382
Prisoners of the United States 820
Procedure in the Federal courts, reform in 48
Promotions during fiscal year in Army 522
Properties of materials, determination of, by Bureau of Standards 1598
Providence Hospital 519
Public and Indian lands entered since 1906 1162
Public animals 374
Public buildings:
Alaska 1107
Appropriations for, July 1, 1911, to June 30, 1912 219
Contract liabilities existing on June 30, 1912 219
Reduction of time in construction of 72
Statement concerning, by Supervising Architect 218
Public buildings and grounds, District of Columbia, improvement and care of, during fiscal year ending June 30, 1912 607
Public debt:
1911 and 1912 104
Transactions in the 103
Public domain (*see also* Public lands):
Comprehensive classification policy for the 1031
Statistics relating to disposition of 1154
Public funds 375
Public Health Service:
Domestic (Interstate) Quarantine Division, operations of 223
Foreign and Insular Quarantine and Immigration, Division of, operations of 222
Hygienic Laboratory, operations of 221
Leprosy, investigation station, Hawaii 222
Marine Hospitals and Relief, Division of, operations of 224
Medical inspection of immigrants 223
Recommendations regarding 225
Sanitary Reports and Statistics, Division of, operations of 224
Scientific Research, Division of, operations of 220
Secretary of the Treasury relative to 75
Public-land prosecutions 795

Page.
Public lands (*see also* General Land Office):
Carey Act, applications under ... 1064
Classification of, by the Geological Survey ... 1067, 1202, 1204
Classification policy for ... 1031
Coal classification of, and valuation ... 1125
Coal-land leases ... 1036
Enlarged homestead designations ... 1127
Homestead laws ... 1034
Mineral-land withdrawals ... 1128
Mining laws ... 1038
Oil-land withdrawals and restorations ... 1126
Phosphate-land withdrawals and restorations ... 1126
Power-site reserves ... 1127
Public water reserves ... 1127
Railroad grants ... 1064
Reclamation entries ... 1035
State and Territorial grants ... 1064
Stream utilization ... 1049
Surveyed and unsurveyed ... 1163
Water power ... 1042
Withdrawals under act of March 15, 1910 ... 1162
Public roads:
Bond issues ... 1371
Economic investigations and model systems ... 1369
Highway engineering, instruction in ... 1370, 1467
Lectures, exhibits, and road-improvement trains ... 1371
Maintenance of ... 1371
Materials, testing road ... 1466
Mileage of roads ... 1469
Object-lesson and experimental roads ... 1369
Road improvement, economic benefit of ... 1469
Special inspection and advice ... 1319
Standard systems ... 1468
Types of roads, models ... 1467
Work of, office of ... 1368
Public schools, rifle shooting in ... 1329
Public surveys ... 1063
Public surveys, Texas-New Mexico boundary ... 1064
Public water reserves ... 1127
Publications Branch, Geological Survey ... 1069
Publications, Division of, Agriculture, Department of ... 1345
Pure-food law ... 56
Quartermaster General, Army, report of ... 384
Quartermaster's Department, Army ... 325
Construction and repair ... 408
Financial ... 392
Personnel ... 385
Repairs ... 415
Reservations and revocable licenses ... 410
Rabies of dogs and other animals ... 1428
Radio communication on ocean steamers ... 1641
Radio stations, Navy ... 920
Radiotelegraphy ... 628
International control of ... 630
National control of ... 631
Navy ... 880, 967
Revenue-Cutter Service ... 232
Railroad grants ... 1064
Railroads, land grants to ... 1159
Railway accidents ... 1784
Rate schedules and application of rates ... 1749
Rates for money ... 139
Rates, restricted, cases on, Interstate Commerce Commission ... 1767
Rations:
Analysis of emergency ... 429
Examination of emergency ... 503

Page.
Rebates and unlawful discriminations 783
Receipts and disbursements of the Government 87
Reclamation:
Entries 1035
Entries and water-right charges 1151
Irrigation policy, national 1051
Lower Colorado River, work along the 1058
Reclamation projects, net investment in 1071
Reclamation Service:
Operation and maintenance results 1072
Report of the Secretary of the Interior on 1070
Summary of results 1071
Reclamation work, General Land Office 1145
Reclamation work under Indian service 1084
Recruiting, Army 373, 447
Reforestation 1325
Register of the Treasury:
Bonds, number and amount received, examined, entered, sealed, and signed in office of 203
Coupon bonds handled by 207
Coupon bonds redeemed during year ended June 30, 1912 204
Coupons, number redeemed by 207
Currency handled by 210
Gold certificates handled by the 210
Interest checks handled by 209
New division recommended for office of 214
Registered bonds redeemed during year ending June 30, 1912 203
Report of 203
Regular Army reserve 37
Relief of Mississippi flood sufferers 241
Religious work among the Indians 1087
Reservations:
Jurisdiction over 383
National game and bird 1341
Reservoir declaratory statements 1141
Revenue-Cutter Service:
Building program of 76
Cadets 233
New vessels and repairs 233
Operations of 230
Radiotelegraphy in 232
Rice crop 1274
Rifle shooting in public schools 329
Ripley *v.* United States, abstract of decision of 841
River and harbor improvements 600
River and harbor act of March 3, 1909, survey of intracoastal waterways from Boston, Mass., to the Rio Grande, required by 605
Roads (*see also* Public roads), Alaskan 1107
Rock Island Arsenal 559
Rural Education, Division of 1193
Rye crop 1274
Safety-appliance act, judicial interpretation of 1790
Safety-appliance act, cases under 782, 1790
Safety of life at sea 1640
St. Louis post office a model 1699
San Antonio Arsenal 571
San Jose scale 1403
Sandy Hook Proving Ground 559
Sanitary condition of transports 503
Sanitation, Army, in United States 481
Sanitation, Indian 1082
Sanitation in the camps on the Mexican border 481
Sanitation in Philippine Islands 490
School Administration, Division of 1190
School Hygiene and Sanitation, Division of 1191
Scientific work of the Geological Survey 1199

Page.
Seacoast carriages 558
Seacoast defenses 255
Seacoast guns and carriages, improvements in, installed 558
Seal of the Treasury Department 213
Seal treaty, law enacted to carry into effect 1523
Searchlights, Army 650
Secret Service, Secretary of the Treasury relative to 77
Seed distribution, Department of Agriculture 1391
Seed, pure, for the farmer 1388
Service cap and campaign hat, Army 482
Sheep and goats, experiments in breeding of 1302
Sheep scab 1422
Sherman law. (*See* Antitrust law.)
Ships, Navy (*see also* Vessels, Navy):
Additional paymaster on large ships 978
Authorized, but not authorized during present administration 875
Contracted for during fiscal year of 1912 875
Eight-hour restriction in building of 875
Delivered and commissioned during fiscal year 1912 875
Historic 935
Launched and completed during present administration 874
Launched, but not completed during present administration 875
Launched prior to, but completed during present administration 874
List of 957
Receiving 881, 935
Standard organizations 572, 934
Standardizing libraries of 936
Shoes in Army 482
Siberia, relations with 21
Signal Corps 328
Alaska, Philippines, and United States operations in .....
Cable system 619
Enlisted men, condition of 621
Enlisted men in 627
Extensions and betterments 619
Field companies of 627
General depots of supply 623
Laboratory 627
Manuals 627
New signal code 626
Organized Militia 625
Philippine Islands, operations in 622
Posts 623
Radio stations 620
Report of 617
Telegraph reservations 621
United States, operations in 622
Silver certificates 120
Silver coinage in Philippines 661
Silver, production of, in United States 216
Small arms, Army, report on 550
Small-arms firing 360
Smallpox in Army 477
Smokeless powder in Army 553
Société Anonyme des Anciens Etablissements Crib *v.* United States, abstract of decision of 833
Soil-bacteriology and plant-nutrition investigations 1397
Soil chemistry 1330
Soil physics 1331
Soil surveys 1409
Soils, Bureau of:
Commercial fertilizers 1411
Fertilizer investigations 1331
Future productivity 1411
Maladaptation 1410
Soil-fertility investigations 1332
Soil investigations 1408

	Page.
Soils, Bureau of—Continued.	
Soil-water investigations	1332
Soils, adaptation of	1409
Work of	1329
Solicitor, Department of Agriculture	1290
South American Republics, our relations with	24
Southern Pacific merger, status of case	773
Southern Pacific Railroad Co., oil-land suits against	796
Southern Pacific Railway Co. *v.* United States, abstract of decision of	830
Southern Pacific Railroad Co. *v.* United States, abstract of decision of	831
Special trust funds	130
Spirochœtes and fusiform bacilli in lesions of the throat, mouth, lungs, and integument	497
Spitzbergen	21
Springfield Armory	562
Spurious issues of currency	129
Staff, General	285
Standard measuring apparatus, testing of	1594
Standard silver dollars	126
Standards:	
Comparison of	1591
Construction of	1592
Custody of	1591
Problems connected with	1596
Testing of	1594
Standards, Bureau of:	
Field investigations of	1594
Physical constants, determination of, by	1597
Properties of materials, determination of	1598
Work of, in general	1590
State and Territorial grants	1064
State Department, reorganization of	6
State desert-lands, segregation of	1162
Statistics, Bureau of:	
Deficiencies in service of	1590
Department of Agriculture	1348
Work of, in general	1585
Statistics, division of, Interstate Commerce Commission	1771
Steam Engineering, Bureau of, Navy, report of Chief of	965
Steamboat-Inspection Service:	
Classification for hull inspection	1646
Control over transportation of dangerous articles	1647
Inspection of motor vessels	1647
Passenger steamers, overloading of	1648
Statistical summary of work	1645
Uniform administration of law	1647
Steel Corporation, status of case against	774
Stream utilization	1049
Subaqueous tests, Navy	879
Submarine-mine defense	649
Submarine mining, manual for	643
Submarine mines:	
Instruction and practice in	642
The service of	642
Subsidiary silver coin	127
Subsistence Department, Army	326
Consolidation of, into Quartermaster Corps	436
Erection and repairs of ovens	433
Field bakeries	433
General	433
Philippine Islands	433
Post and field bakeries	433
United States and Alaska	432
Subsistence supplies, change in method of procuring	432
Sugar and sugar products, investigation of	1311
Sugar crop	1275
Sugar frauds at the port of New York	792
Sugar Trust, status of case against	773

Page.
Suits against the Government, statement concerning ... 816
Sunk-land cases ... 798
Supervising Architect, Office of, report of ... 218
Supplies and Accounts, Bureau of, Navy, report of chief of ... 969
Supplies:
  Examination of contract ... 1315
  Medical and hospital, Army ... 528
  Testing contract, by Department of Agriculture ... 1459
Supreme Court of the United States:
  Abstract of decisions at October, 1911, term in which United States was a party ... 824
  Interstate commerce cases decided by ... 1758
  Number and disposition of cases wherein United States was a party ... 813
Surgeon General, Army, report of ... 439
Surgeon General, Navy, report of ... 981
Surgical operations, Army ... 446
Surveyed and unsurveyed public lands ... 1163
Surveying, General Land Office ... 1137
Surveys. (*See* Public surveys.)
Surveyors General, list of offices of ... 1156
Surveyors General offices and local offices, certified copies of records in ... 1152
Syphilis, studies in ... 521
Tang Tun *v.* Edsell, Chinese inspector, abstract of decision of ... 827
Tariff schedules, suspension of proposed changes in ... 1755
Tariff, statement of the President relative to the ... 34
Tarsney Act, repeal of ... 84
Taxation, Indian lands ... 1081
Temperature, influence of tropical residence on the body ... 496
Territories under the Department of the Interior ... 1102
Texas fever ... 1421
Texas-New Mexico boundary:
  Reestablishment of ... 1139
  Survey of ... 1064
Thirteenth Decennial Census, financial statement of, to June 30, 1912 ... 1562
Three-year homestead act ... 1150
Timber and stone entries, number of ... 1157
Timber-culture entries, number of ... 1158
Timber lands, Indian ... 1083
Tobacco crop ... 1273
Tobacco investigations, results of, Department of Agriculture ... 1386
Topographic Branch, Geological Survey ... 1069
Torpedo depot ... 649
Torpedoes and mines, Navy ... 946
Torpedoes used by the Navy ... 878
Towing monopoly, status of case against ... 774
Trade commission, proposed establishment of ... 1576
Trade-marks:
  Applications for ... 1183
  Collection ... 1187
Trade with noncontiguous territories ... 1589
Traders' claims, Indian Service ... 1086
Traffic via Isthmuses of Panama and Tehuantepec ... 1589
Trans-Atlantic steamship pool, status of case ... 773
Transport service:
  Alaska ... 429
  Army ... 3, 75, 426
Transportation:
  Army ... 414
  Development in Alaska ... 1040
Transports:
  Increased allowance of for troops on ... 428
  Sanitary condition of ... 503
Treasurer of the United States:
  General account of the ... 115
  Legislation recommended by ... 132
  Report of ... 101

	Page
Treasury:	
Available cash balance	108
Cash in the vaults	106
Condition of, June 30, 1912	90
Condition of, receipts and disbursements, etc	87
General fund	106
Gold in the	108
Ordinary receipts for 1911 and 1912 classified	101
Reserve and trust funds	105
Statement of	106
Treasury Building, improvement of	70
Treasury Department:	
Abstracts of reports of bureaus and divisions of	215
Assay offices	216
Board of General Appraisers, investigation of the	68
Business with the public	73
Chief clerk's office, reorganization of	78
Comptroller of the Currency, report of	133
Consolidation of bureaus in	82
Contingent fund	86
Customs	66
Customs districts, reorganization of	69
Disbursing clerk	78
Engraving and Printing, Bureau of, report of	216
Estimates of appropriations	97
Extension of civil service in	78
General Supply Committee	78
Internal-revenue administration	70
Internal Revenue, Commissioner of, report of	188
Life-Saving Service, report of	226
Mint Service, report of	215
Politics and the service	70
Public Health Service, report of	220
Register of the Treasury, report of	203
Revenue-Cutter Service, report of	230
Seal of	213
Solicitor of the, summary of report of	817
Supervising Architect, Office of, report of	218
Supervisor of the expressions of laws recommended	84
Treasury notes of 1890	119
Treasury notes, United States seven-thirty	209
Treasury, Report of the Secretary of	63
Troops:	
Engineer equipment of	596
Influence of station on	444
Subsisting the	373
Troy Dam	259
Trust funds, special	130
Tubercle bacilli	1426
Tuberculosis:	
Animals	1303
In Army	474
Turkish-Bulgarian War	20
Turpentine, investigations of	1496
Twenty-eight hour law	783, 1292, 1509
Typhoid fever prophylactic	520
Typhoid fever, vaccination against, in Army	462
Typhoid in the Philippines	497
Ultra-violet rays, the effect of, on animal parasites in water	501
Unappropriated lands on June 30, 1912	1163
Uniform material, olive-drab cotton	493
United States Commerce Court, business transacted in	811
United States district courts, business transacted in	810
United States female prisoners, needed provision for	823
United States military prison	362

	Page.
United States penitentiaries:	
Atlanta, Ga., report concerning	822
Leavenworth, Kans., report concerning	821
McNeil Island, Wash	822
United States prisoners	820
United States Supreme Court, number and disposition of cases wherein United States was a party	813
United States *v.* Baltimore & Ohio Southwestern Railroad Co., abstract of decision of	839
United States *v.* Bausch, abstract of decision of	832
United States *v.* Barnes, abstract of decision of	842
United States *v.* Citroen, abstract of decision of	826
United States *v.* Colorado Anthracite Co., abstract of decision of	833
United States *v.* Congress Construction Co., abstract of decision of	827
United States *v.* Eckstein, abstract of decision of	827
United States *v.* Ellicott, abstract of decision of	829
United States *v.* Fidelity Trust Co., abstract of decision of	834
United States *v.* Garlish, abstract of decision of	835
United States *v.* Miller, abstract of decision of	843
United States *v.* McMullen et al., administrators, abstract of decision of	829
United States *v.* Morgan, abstract of decision of	839
United States *v.* Munday, abstract of decision of	842
United States *v.* Nord Deutscher Lloyd, abstract of decision of	843
United States *v.* Plyler, abstract of decision of	835
United States *v.* Ripley, abstract of decision of	841
United States *v.* Société Anonyme des Anciens Etablissements Cail, abstract of decision of	833
United States *v.* Southern Pacific Railroad Co., abstract of decision of	831
United States *v.* Stever, abstract of decision of	838
United States *v.* Wong You, abstract of decision of	843
United States ex rel. Lowe *v.* Fisher, Secretary of the Interior, abstract of decision of	835
United States ex rel. Turner *v.* Fisher, abstract of, decision of	827
United States, Interstate Commerce Commission, and Federal Sugar Refining Co. *v.* The Baltimore & Ohio Railroad Co., abstract of decision of	844
University, Howard	1119
Vaccine, distribution of, etc., by Bureau of Animal Industry	1305
Venereal diseases:	
In Army	467
In Navy	983
Vessels, Navy (*see also* Ships, Navy):	
List of	957
Progress of work on new	874
Volunteers:	
Army	300
Persons qualified to hold volunteer commissions	343
Walter Reed General Hospital	509
War Department:	
Adjutant General, report of	331
Chief of Staff, report of	285
Statement of the President concerning	34
War, Secretary of, report of	235
Warren *v.* United States, abstract of decision of	830
Washington's words regarding the way to keep peace	867
Water carriers, accounts of	1769
Water power:	
Navigable waterways and their appurtenant	257
Regulation of	42
Views of the Secretary of the Interior on	1042
Water Resources Branch, Geological Survey	1069
Water-right charges	1151
Water rights, Attorney General relative to	798
Waters, investigation of	1313
Watertown Arsenal	568
Watervliet Arsenal	566
Waterways Commission, the International	261

Page.
Weeks Forestry Act 1515
Acquisition of lands under 1327
Examinations under 1049, 1069
Weight, influence of tropical residence on 495
Weather Bureau:
Barometry, thermometry, and cloud observations 1446
Cold-wave warnings 1437
Cooperative observations and climatological reports 1442
Equipment and apparatus, instrumental 1443
Evaporation studies 1445
Forecasts and storm warnings 1274, 1438
Forest and rainfall investigations 1445
Frost studies and warnings 1439
Library of 1449
Mount Weather (Va.) Research Observatory, work of 1447
Mountain snowfall work 1446
Observations and forecasts, extensions of 1435
Observations and reports of 1297
Publications 1443
Radiotelegraph, use of the 1436
River and flood service 1440
School of instruction of 1299
Storms of tropical origin 1437
Vessel-reporting service 1442
Weekly forecasts 1436
Work of 1434
Wheat crop 1272
White fly in Florida, investigation of 1336
White-slave traffic act, violations of 804
Wild animals, importations of 1431
Wireless messages, regulation of 1523
Withdrawals under act of Mar. 15, 1910 1162
Wood *v.* United States, abstract of decision of 828
Workmen's compensation act 45, 49
X-bodies in blood, the so-called 503
Yards and Docks, Navy, report of Chief of Bureau of 917
Yellowstone National Park, improvement of, including construction, repair, and maintenance 612

○

Date Due

PRINTED IN U. S. A.

J 80
A3
1912
v.2

U. S. President

Message from the president of the United States to the two houses of congress

J 80
A3
1912
v.2

U. S. President

Message from the president of the United States to the two houses of congress